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ABSTRACT

This is an evaluation of Phase Two of the Federal Library Network Prototype Project which involved the use of telefacsimile and slow-scan television for interlibrary loan and communication activities among federal libraries from July 1978 to March 1980. The evaluation procedure included site visits to participating libraries, analysis of data recorded by participating libraries on transaction forms, interviews with 38 library staff members, a literature review, and discussions with experts. Analysis of the transaction data shows that interlibrary loans accounted for 75 percent of the activity, with correspondence responsible for another 15 percent. Patrons found the information helpful approximately 72 percent of the time. Seventy percent of their requests were for journal articles, with the material available on time 60 percent of the time. Library staff felt that the project did increase contact with other libraries, and 40 percent said they would continue interlibrary loans with these libraries. However, librarians also felt the project increased the work load and that it was unfavorable from that point of view. Overall, the telefacsimile, while useful, seemed to impose a labor-intensive situation on libraries and future trials of slow-scan television in a wider range of contexts are recommended. (Author/MER)

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EVALUATION OF THE
USE OF SLOW-SCAN TELEVISION
AND TELEFACSIMILE

A Report to the

Federal Library Committee,
Library of Congress
and the National Science Foundation

Contract #A80-10

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ACRONYMS

AEC	Atomic Energy Commission
CERC	Coastal Engineering Research Center
CLBL	Project's Library Symbol for Lawrence Berkeley Laboratory
COBBS	Project's Library Symbol for NOAA, Boulder
COE	Corps of Engineers
DNAL	Project's Library Symbol for National Agricultural Library
DNAL-DC	Project's Library Symbol for NAL Branch Library
DOE	Department of Energy
DCER	Project's Library Symbol for Corps of Engineers, Ft. Belvoir
EPA	Environmental Protection Agency
ERDA	Energy Research and Development Administration
ERL	Environmental Research Laboratory
FLC	Federal Library Committee
FLNPP	Federal Library Network Prototype Project
IARG	Project's Library Symbol for Argonne National Laboratory
ILL	Interlibrary loan
INTREX	Information Transfer Experiments
MIDLNET	Midwest Regional Library Network
MSVE	Project's Library Symbol for Corps of Engineers, Vicksburg
NBS	National Bureau of Standards

NCHSR	National Center for Health Services Research
NELINET	New England Library Information Network
NOAA	National Oceanic and Atmospheric Administration
NSF	National Science Foundation
NUPB	Project's Library Symbol for Brookhaven National Laboratory
OCLC, Inc.	(formerly Ohio College Library Center)
ORNL	Oak Ridge National Laboratory
OT	Originating Transaction
RT	Responding Transaction
SSTV	Slow-Scan Television
SUNY	State University of New York
TALINET	Talifax Library Information Network
TONL	Project's Library Symbol for Oak Ridge National Laboratory
WES	Waterways Experiment Station

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SECTION I

INTRODUCTION AND SUMMARY

In November 1979, Herner and Company was invited to conduct an evaluation of Phase II of the Federal Library Network Prototype Project. This experimental project involved the use of telefacsimile and slow-scan television for interlibrary loan and communication activities among federal libraries between the period July 1979 to March 1980. The Project was funded by the National Science Foundation with the Federal Library Committee, Director's office, providing project administration and the director of the ERL Libraries serving as Project Director.

The evaluation procedure included site visits to the participating libraries, the analysis of data recorded by the participating libraries on transaction forms, interviews with 38 library staff members who used the equipment and participated in the Project, a review of the literature, and discussions with experts, including Oversight Committee Members.

Analysis of the transaction data showed that interlibrary loans accounted for 75 percent of the activity, with correspondence responsible for another 15 percent. For transmission, Rapifax was used 86 percent of the time; QWIP, 6 percent; the telephone, 2 percent; and slow-scan television, 1 percent.

Patrons found the information helpful approximately 72 percent of the time. Seventy percent of their requests were for journal articles; the material was "on time" 60 percent of the time, although time in which the article was wanted was not always specified.

Library staff interviewed felt that the Project did increase contact with other libraries and 40 percent felt they would continue interlibrary loan with these libraries. Overall, librarians felt the Project increased the work load and regarded it unfavorably from that point of view.

In essence, the evaluators found that telefacsimile--while useful--imposed a labor-intensive situation on libraries, and that although slow-scan television offers a wide range of possibilities for communications, its trial in this project was limited to only a few of those possibilities.

Recommendations are offered for further exploration which should be conducted under controlled conditions with detailed protocols.

SECTION II

BACKGROUND OF STUDY

A. Purpose of Study

In 1977 a group of federal libraries discussed some common operating problems--problems of access to desired publications, rising costs of documents, the impact of proliferating data bases, staff and space shortages, travel and budget curtailments, increasing interlibrary loan activity with concomitant slow and unpredictable yet costly mail service. The Project was designed to meet these problems by developing improved methods to share library resources. Equipment was sought both to enable the requester of a publication to screen the requested information, in order to help avoid transmitting unwanted, unnecessary information, and to transmit the precise information desired quickly and cost effectively. The participants selected SSTV equipment to provide the diagnostic and screening capability, and telefacsimile equipment for rapid transmittal. It was hoped that the use of the equipment to transmit, communicate, and exchange information would promote resource sharing and enable the participants to draw on the subject specialties and expertise of member libraries.

B. Project Description and Experimental Design Of Phase I

In mid-1977, five federal agencies agreed to contribute operating funds and lease equipment in order to participate in the experimental project. Phase I was to be a six-month experiment in the use of telefacsimile and slow-scan equipment for the purposes of resource sharing in a manner beneficial to the participant libraries and to their patrons. The equipment was not specifically designed for library application; however it was hoped that a demonstration to the industry of inadequacies of the equipment for library use would encourage the development of devices especially suited for libraries. The agencies involved were National Oceanic and Atmospheric Administration (NOAA), Army Corps of Engineers (COE), Environmental Protection Agency (EPA), National Bureau of Standards (NBS), and Energy Research and Development Administration (ERDA), now the Department of Energy (DOE). Their libraries were situated at the following locations:

Boulder, CO - Environmental Research Laboratories, NOAA
Rockville, MD - Environmental Data Services, NOAA
Miami, FL - Environmental Data Services
Ft. Belvoir, VA - Coastal Engineering Research Center, COE
Vicksburg, MS - Army Engineer Waterways Experiment Station, COE
Raleigh, NC - Environmental Protection Agency
Cincinnati, OH - National Environmental Research Center
Gaithersburg, MD - Standards Information Services, NBS
Argonne, IL - Argonne National Laboratory, DOE
Upton, NY - Brookhaven National Laboratory, DOE
Berkeley, CA - Lawrence Berkeley Laboratory, DOE

Three New England Library Network (NELINET) libraries joined the group a few months later: Portland Public Library, Portland, Maine, and Maine State Library in Augusta, Maine, joined in November; the University of Maine joined the following March, bringing the total number of participant libraries to 14.

The project for Phase I was designed to encompass the following tasks:

- the development of methods and procedures in the form of a Pilot Project Plan drawn up by an outside contractor
- the establishment of an "Oversight Committee"
- the installation of the equipment at each location
- the training of library staff in the use of the equipment and the procedures of data collection

> the operation of the experiment, i.e., the exchange of information, documents, and resources among member libraries and the recording of each such transaction
> the examination and analysis of the recorded transactions
> the conduct of interviews with library staff and library patrons
> an evaluation report of the experimental project prepared by an outside contractor
> an application for funding to continue the experiment for an additional period (Phase II).

The experimental design, with its procedures, methods, forms, guides, and protocols, was prepared by Edward Leyman at Herner and Company. It was adopted by all participants and they were given free and easy access to the design documentation. The design, entitled "Slow-Scan Television/Telefacsimile Experimental Project: Pilot Project Plan", is attached as Appendix A.

The operation of Phase I of the experiment took place from July, 1978 to January, 1979. The library staff gained familiarity with the equipment and with member libraries' collections and resources. The experimental design was tested and the results of the analysis of operations were presented in a report prepared by Edward Leyman, entitled _Preliminary Analysis of the Slow-Scan Television/Telefacsimile Library Network Project: Pilot Stage_, Washington, D.C., Metrostudy Corporation, March 1979. Recommendations concerning Phase II (continued operations for the full experiment) were included.

C. Evaluation of Phase I: Recommendations

Regarding telefacsimile equipment, the report stated that "Experiences with telefacsimile during the pilot operations point to promising results:

that the use of this equipment can facilitate the exchange of information; can speed up delivery, particularly when time is of the essence; can foster broader, more profitable use of all participating libraries' information sources and resources; can bring to the more isolated libraries the benefits of being located in a resource-rich community. There are some preliminary indications that the benefits of telefacsimile communications for a number of the libraries may well be in balance with the costs entailed."

The report recommended that participating libraries' originating and responding transaction forms be collected and examined centrally on a continuous basis; that the transaction forms be redesigned and simplified; that procedures be set up and agreed on by participants regarding monitoring protocols; that participating libraries be able and willing to agree to basic handling criteria; that new libraries selected for Phase II be libraries located in isolated facilities since these provide a better test of telefacsimile's capabilities.

Regarding slow-scan television, the report stated that "Slow-scan television was not fairly and properly tested during this pilot stage... slow-scan television is new to most people and needs to be approached in a more creative and imaginative spirit. This did not take place during the pilot stage."

It was recommended that the slow-scan equipment be more vigorously tested during Phase II, installed in a highly visible location in only three or four of the libraries, those that have sufficient staff to deal with this labor-intensive device, and that have as patrons laboratory scientists and engineers actively engaged in research.

D. Chronology

Table 1, which follows, contains a brief chronology of the Project. The table lists activities in both Phase I and II. While this section describes the background of the Project prior to Phase II with which this report is concerned, the chronology is inserted at this point to give the reader a sense of the continuity of events on the Project.

Table 1

BRIEF CHRONOLOGY OF THE PROJECT

June 1977	Participant libraries of Phase I commit funds to experiment with SSTV and Telefacsimile equipment, FLC accepts sponsorship, Joan Maier named Project Director
September 1977	Herner and Company receives contract for project design
December 1977	Herner and Company submits project design, prepared by Edward Leyman
February 1978	Proposal to fund Phase II and its evaluation submitted to NSF
March 1978	Equipment procurement for Phase I initiated
June 1978	Equipment installed in the 14 Phase I participant libraries
July 1978	Phase I operation commences
August 1978	NSF agrees to fund Phase II of experiment and its evaluation by Herner and Company
January 1979	Phase I operations conclude, Metrostudy Corporation receives contract for Preliminary Evaluation to be performed by Edward Leyman
March 1979	Preliminary Evaluation Report submitted
April 1979	Three new participant libraries identified
July 1979	Phase II operation commences with six of the original libraries and four new ones
November 1979	Herner and Company receives evaluation contract for Phase II already nearing its completion
January 1980	Phase II due to conclude; 3-month extension granted
March 1980	Phase II operations conclude
May 1980	Herner and Company submits draft of evaluation report for Phase II

SECTION III

DESCRIPTION OF PHASE II

A. Participating Libraries

Ten libraries participated in Phase II. They are listed below. The first six participated in Phase I; the last four were new participants.

The Environmental Research Laboratories (ERL) Library. NOAA

The Army Engineer Waterways Experiment Station Technical Information Center, COE

The Coastal Engineering Research Center Library, COE

The Argonne National Laboratory, Technical Information Department, DOE

The Brookhaven National Laboratory Research Library, DOE

The Lawrence Berkeley Laboratory Library, DOE

The Oak Ridge National Laboratory (ORNL) Library System, DOE

The National Agricultural Library (NAL), Department of Agriculture Science and Education Administration, Technical Information Systems and its D.C. Branch Library, which participated only with NAL

The National Science Foundation Library

These libraries varied in size of collection and staff, local resources, interlibrary loan activity, subject orientation of collection, type of users, the kinds and type of location of equipment used on this project. Their needs--and thus their willingness for resource-sharing--varied. A full description of each library appears in Section IV.

B. Recording Procedures Followed by Each Library During Participation in the Experiment

The "Pilot Project Plan" had set up special forms to be used for recording data in a standardized manner. Every transaction involving member libraries of the network was to be so recorded. At regular intervals, the libraries were to forward completed transaction forms to a central location, so that the forms could be reviewed immediately to make sure that they were being used and administered properly, and also to provide up-to-date feedback, in case any discrepancies in methodology were noted. The data from these completed forms were to be extracted on an on-going basis. (See Herner and Company Pilot Project Plan, page 5). The evaluation of the pilot stage recommended that additional data be gathered, that it be gathered in a more uniform and controlled manner, and that, with regard to the procedures for the full experiment, the transaction forms be redesigned and simplified (See Metrostudy Corp. Preliminary Analysis: Pilot Stage, page 49). The forms were, accordingly, revised. However, it appears that the new forms were no more accurately nor more fully completed than the old. They did not enable data to be gathered in a more uniform manner since each library did not fill out the forms in the same manner, and some did not even fill them out at all. It did not enable data to be gathered in a more controlled manner, since neither in Phase I nor in Phase II were the transaction forms photocopied and mailed to a central location for monitoring, for on-going analysis, or for data extraction.

It is indeed unfortunate that the participating libraries' originating and responding transaction forms were not collected and examined centrally on a continuous basis. This has made it as difficult in Phase II as it was in Phase I to quantify results with any acceptable reliability or to draw substantive conclusions from experimental findings.

Another recommendation from Phase I was that "participating libraries be able and willing to agree to basic handling priorities, standards, and criteria" (Preliminary Analysis: Pilot Stage, page 50). Unfortunately, the participating libraries agreed instead not to impose controlled conditions on the Project as a whole.

The transaction forms are shown in Figures 1 and 2. They requested identifying information such as transaction number, the libraries' symbols, and the names of the operators at originating and responding libraries. The Transaction Log - Originating Library provided areas to record:

> type of request

> patron name and phone number

> patron's delivery deadline

> delivery of response

> whether material is copyrighted

> method of response requested

> transmittal method of request

> telefacsimile transmission time and speed

While the participating libraries always noted the type of request, patrons' phone numbers were not always recorded and one library did not even record patrons' names. Copyright information, when known, was noted. While transmission methods, times, and speeds were specified, delivery deadlines and delivery of response, more often than not, were not. Thus all-over turnaround times could not be calculated.

The Transaction Log - Responding Library provided areas to record:

> copyright information

> transmittal method of response

> form of document sent

> telefacsimile transmission time and speed

Some libraries did not record all responses on their forms, particularly if the response was negative. Others filled out the forms inconsistently or incompletely.

Figure 1

ORIGINATING LIBRARY'S SYMBOL

TRANSACTION LOG - ORIGINATING LIBRARY

PHASE II
F.L.N.P. PROJECT

1. TRANSACTION NUMBER	#	#	#
2. DATE			
3. OPERATOR OF EQUIPMENT AT ORIGINATING LIBRARY			
4. LIBRARY CONTACTED			
5. PERSON AT LIBRARY CONTACTED			
6. TYPE OF REQUEST:			
a. Interlibrary Loan(specify ALA,FLNP,etc)			
b. Literature Search			
c. Reference Question			
d. Correspondence			
e. Other (specify)			
7. PATRON'S NAME AND TITLE			
a. Telephone Number			
8. PATRON'S DELIVERY DEADLINE:			
a. Within 1 Workday			
b. Within 2 Workdays			
c. Within 1 Week			
d. Within 2 Weeks			
e. Other (specify)			
9. DELIVERY OF RESPONSE TO PATRON:			
a. Within 1 Workday			
b. Within 2 Workdays			
c. Within 1 Week			
d. Within 2 Weeks			
e. Other (specify)			
10. MATERIAL COPYRIGHTED?(STATE YES, NO, OR UNSURE)			
11. DID YOU SPECIFY METHOD OF RESPONSE?			
a. If yes, state response method specified			
12. REQUEST TRANSMITTED BY:			
a. Telephone			
b. U.S. Mail			
c. Delivery Service			
d. SSTV (complete reverse side of log)			
e. Telefacsimile (Rapifax, Qwip 2 or)			
13. IF TELEFACSIMILE WAS USED:			
a. Transmission Time in Minutes			
b. Number of Pages			
c. Transmission Speed (Qwip 2)			
d. Transmission Speed (Rapifax)			
e. Transmission Speed ( )			
14. CONTACT SATISFACTORY?(IF NOT, SPECIFY REASONS)			
15. ADDITIONAL COMMENTS OR PROBLEMS ENCOUNTERED			

22

21

COMPLETE THIS SIDE IF SSTV WAS USED FOR TRANSMISSION

1. TRANSACTION NUMBER (SHOULD MATCH WITH NUMBER ON REVERSE SIDE)	#	#	#
2. FORM OF DOCUMENT TRANSMITTED ON SSTV:			
a. Journal			
b. Book			
c. Report			
d. Map			
e. Photograph			
f. Chart or Graphic Material			
g. Abstract or Citation			
h. Three-dimensional Object			
i. Other (specify)			
3. COLOR GRADATION OF MATERIAL:			
a. Black and White			
b. Shades of Gray			
c. Color Present			
d. Mixed			
e. Not Applicable			
4. MATERIAL TRANSMITTED FROM PHOTOCOPY OF ORIGINAL?:			
a. Yes			
b. No			
5. SPECIFICS OF TRANSMISSION:			
a. Transmission Time in Minutes			
b. Number of Pages			
c. Number of Transmissions Required			
d. Material Transmitted from Left to Right			
e. Top-to-bottom			
f. Mixed Transmission			
6. CONTACT SUCCESSFUL?:			
a. Yes			
b. No (specify reasons)			
7. ADDITIONAL COMMENTS OR PROBLEMS ENCOUNTERED			

Figure 2

TRANSACTION LOG - RESPONDING LIBRARY

PHASE II F.L.N.P. PROJECT

1. ORIGINATOR"S TRANSACTION NUMBER	#	#	#
2. DATE			
3. RESPONDING LIBRARY'S SYMBOL			
4. OPERATOR OF EQUIPMENT AT RESPONDING LIBRARY			
5. PERSON AT ORIGINATING LIBRARY (IF NOT RECEIVED AUTOMATICALLY)			
6. MATERIAL COPYRIGHTED?(STATE YES, NO, OR UNSURE)			
7. RESPONSE TRANSMITTED BY:			
a. Telephone			
b. U.S. Mail			
c. Delivery Service			
d. SSTV(complete reverse side of log)			
e. Telefacsimile (Rapifax, Qwip 2 or)			
8. FORM OF DOCUMENT(S) SENT OR TRANSMITTED BY RESPONDING LIBRARY:			
a. Journal			
b. Journal Article			
c. Book			
d. Report			
e. Map			
f. Photograph			
g. Chart or Graphic Material			
h. Abstract or Citation			
i. Handwritten Material			
j. Other (specify)			
9. IF TELEFACSIMILE WAS USED:			
a. Transmission Time in Minutes			
b. Number of Pages			
c. Transmission Speed (Qwip 2)			
d. Transmission Speed (Rapifax)			
e. Transmission Speed ( )			
10. CONTACT SATISFACTORY? (IF NOT, SPECIFY REASONS)			
11. ADDITIONAL COMMENTS OR PROBLEMS ENCOUNTERED			

COMPLETE THIS SIDE IF SSTV WAS USED FOR TRANSMISSION

1. ORIGINATOR'S TRANSACTION NUMBER (SHOULD MATCH WITH NUMBER ON REVERSE SIDE)	#	#	#
2. FORM OF DOCUMENT TRANSMITTED ON SSTV:			
a. Journal			
b. Book			
c. Report			
d. Map			
e. Photograph			
f. Chart or Graphic Material			
g. Abstract or Citation			
h. Three-dimensional Object			
i. Other (specify)			
3. COLOR GRADATION OF MATERIAL:			
a. Black and White			
b. Shades of Gray			
c. Color Present			
d. Mixed			
e. Not Applicable			
4. MATERIAL TRANSMITTED FROM PHOTOCOPY OF ORIGINAL?:			
a. Yes			
b. No			
5. SPECIFICS OF TRANSMISSION:			
a. Transmission Time in Minutes			
b. Number of Pages			
c. Number of Transmissions Required			
d. Material Transmitted from Left to Right			
e. Top-to-bottom			
f. Mixed Transmission			
6. CONTACT SUCCESSFUL?:			
a. Yes			
b. No (specify reasons)			
7. ADDITIONAL COMMENTS OR PROBLEMS ENCOUNTERED			

Communication between participating libraries, other than requests for interlibrary loan (ILL) items, took the form of memos, letters, and handwritten notes telefaxed from one site to another. Often handwritten notes were jotted down on the side of an ILL form, requesting clarification, or a particular deadline. Most memos concerning the Project originated from ERL Library NOAA, Boulder, and were sent to all participants. Since all demonstrations of equipment, especially of SSTV, involved additional communications (sometimes by telephone) among the libraries, several persons felt that increased communication between staff from different libraries was a decided benefit derived from the experiment.

C. Description and Placement of the Equipment

Three types of equipment were in use during the Project: QWIP Telefacsimile, Rapifax 100, and Slow-Scan Television.

Description of Equipment

QWIP.--The QWIP facsimile transceiver is a conventional telefacsimile machine that can transmit typewritten, handwritten, or printed input up to 8 1/2" x 11" in size over telephone lines from one member library to another. The Model 1200, the equipment first used, had a 4-minute and a 6-minute transmission speed. At six minutes, resolution was 96 lines to the inch both horizontally and vertically; at four minutes, resolution was 96 lines to the inch horizontally and 64 lines vertically. This model was replaced during Phase II of the Project by the QWIP II, which can transmit at a 3-minute speed (with a resolution of 96 lines to the inch both horizontally and vertically) and a 2-minute speed (with a resolution of 86 lines to the inch horizontally and 78 lines to the inch vertically). Both machines are portable, compact, desk-top models and are simple to operate.

Materials to be transmitted must be mounted by hand to a rotating cylinder. As the cylinder rotates, a fiber optics system scans the material on the cylinder. The scanner's output consists of a continuously modulated (FM) analog signal which is transmitted along conventional telephone lines. At the receiving end, the signal is transferred by an electrosensitive process to a special copy paper on the rotation drum.

Monthly rental was inexpensive ($65.00/month). However, the machine had two major disadvantages. In order to activate the machine, an operator at the originating library had to make a telephone call to the responding library; thus operation required both a sender and a receiver to be present during the transmission. When the machine was in operation, the special recording paper required emitted an odor considered by many to be offensive.

QWIP is manufactured by QWIP Systems, a division of Exxon Enterprises, Inc.

Rapifax.--The Rapifax 100 is a telefacsimile machine which can transmit an 8 1/2 x 11-inch page at speeds of 35, 60, and 90 seconds. It has a machine-to-machine capability and an automatic feed feature. It is a free-standing console model facsimile transceiver offering greater speed and resolution than drum-type facsimile units. It can achieve a resolution of 200 by 200 lines per inch of copy with a 90-second transmission time. Transmission times as short as 35 seconds can be achieved with a loss of resolution.

The Rapifax 100 operates by the flat-bed method. The subject copy lies flat as the scanner analyzes light reflected from tiny portions of its surface. White paper reflects more light than printed copy, and the output signal varies accordingly. The digital output signal is converted to a frequency modulated analog signal for transmission along standard telephone lines.

In the receiving mode, the Rapifax 100 employs the electrofax process with a liquid toner. The specially coated paper is automatically cut from a 460-foot roll. Unattended reception capability reduces the staff time required for operation of this equipment.

Monthly rental is $300.00.

The equipment was easy to operate, though library staff report that paper jams occurred frequently.

The Rapifax 100 is marketed by Rapicom, Inc.

Cost comparisons of the QWIP 1200, the QWIP II, and the Rapifax 100 were made in 1979 by the TALINET Project staff and presented in TALINET II Report of Continuation Grant by the Graduate School of Librarianship and Information Management at the University of Denver (see Appendix D).

Slow-Scan Television.--The slow-scan television equipment consisted of a video camera and compressor to scan the copy and allow transmission over voice grade telephone circuits, along with a video expander and television monitor to reproduce the image at the receiving end.

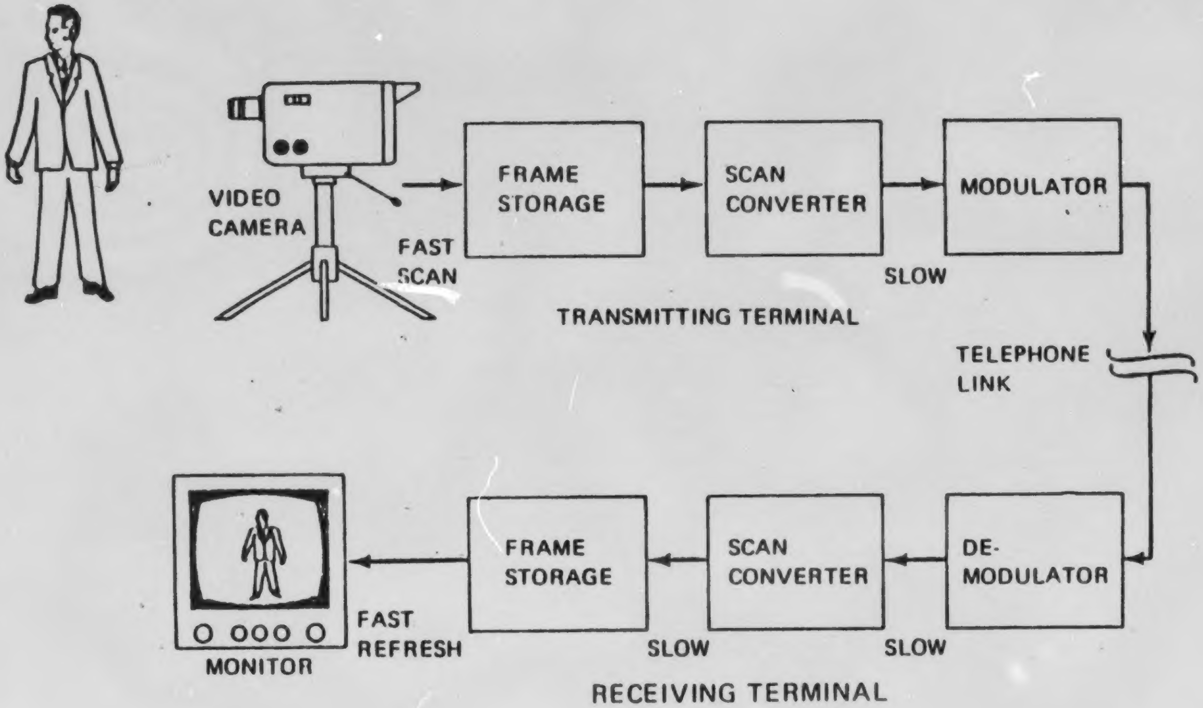
Resolution of the television monitor is set at 525 lines. The camera may be focused on the entire page of copy or, to increase readability, may be set for closeups of individual portions of the copy.

Monthly rental is $960.00.

This equipment does not provide hard copy. The requesting patron must be present at the time of transmission to obtain the required information. Three persons are required for each transaction: the sender, the receiver, and the patron.

Figure 3

SLOW-SCAN TELEVISION FUNCTIONAL DIAGRAM



From: Telehealth Handbook, DHEW Publication No. PHS 79-3210

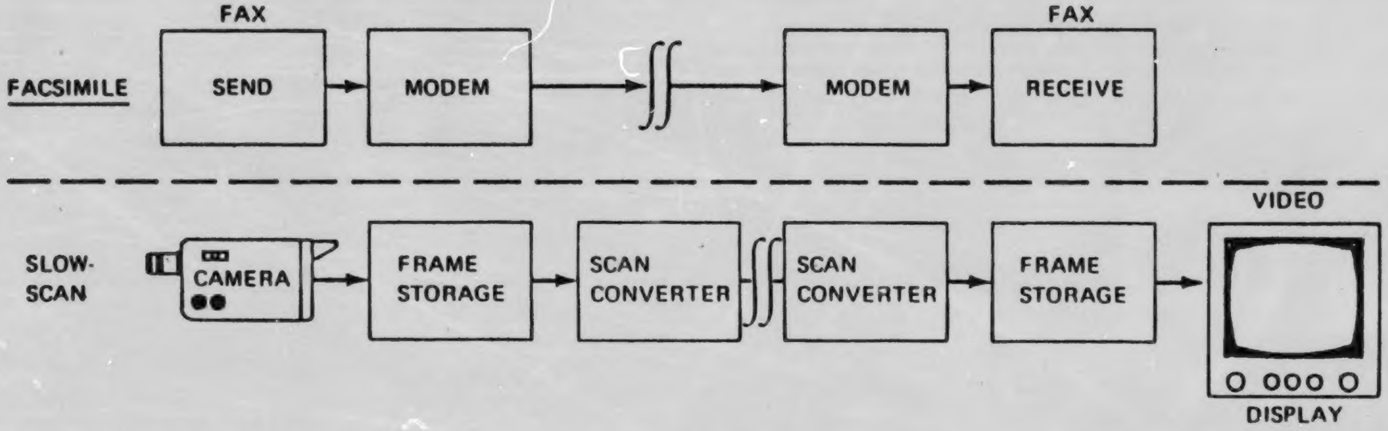


Figure 4

FACSIMILE AND SLOW-SCAN END-INSTRUMENTS

The slow-scan equipment is marketed by Colorado Video, Inc.

Figure 5 shows which libraries had what equipment during Phase II. It can be seen that not all libraries had all the equipment operational for any protracted period of time so that "networking" was not possible throughout Phase II.

The experiments placed no restrictions on the use of the equipment; the libraries, all of which naturally had pre-existing patterns for resource sharing, were not requested to alter these, which also may help to explain why libraries interpreted the requirements of participation in varying ways. There was no central focus, no point of control to help in directing the flow of transactions. These very different, and geographically widely dispersed libraries, were simply loosely banded together in a free network.

Placement of the Equipment in Each Libary

Not all the 10 libraries had all the equipment simultaneously; nor did they all have the three kinds of equipment. Five libraries--Argonne, Brookhaven, Oak Ridge, Lawrence Berkeley, and NSF--did not have slow-scan television equipment installed. The National Agricultural Library in Beltsville and its D.C. Branch Library, both of which ceased participation in December 1979, did receive slow-scan equipment, but it was not operational at Beltsville until the beginning of August, and due to delays in telephone line adjustments, not until November in the Branch. This left ERL Library, COE at Vicksburg, and COE at Fort Belvoir with SSTV which was operational during virtually the whole experiment. Vicksburg reported that they seldom used slow-scan TV because they had difficulty in making it work and because SSTV doesn't accommodate a full page of text.

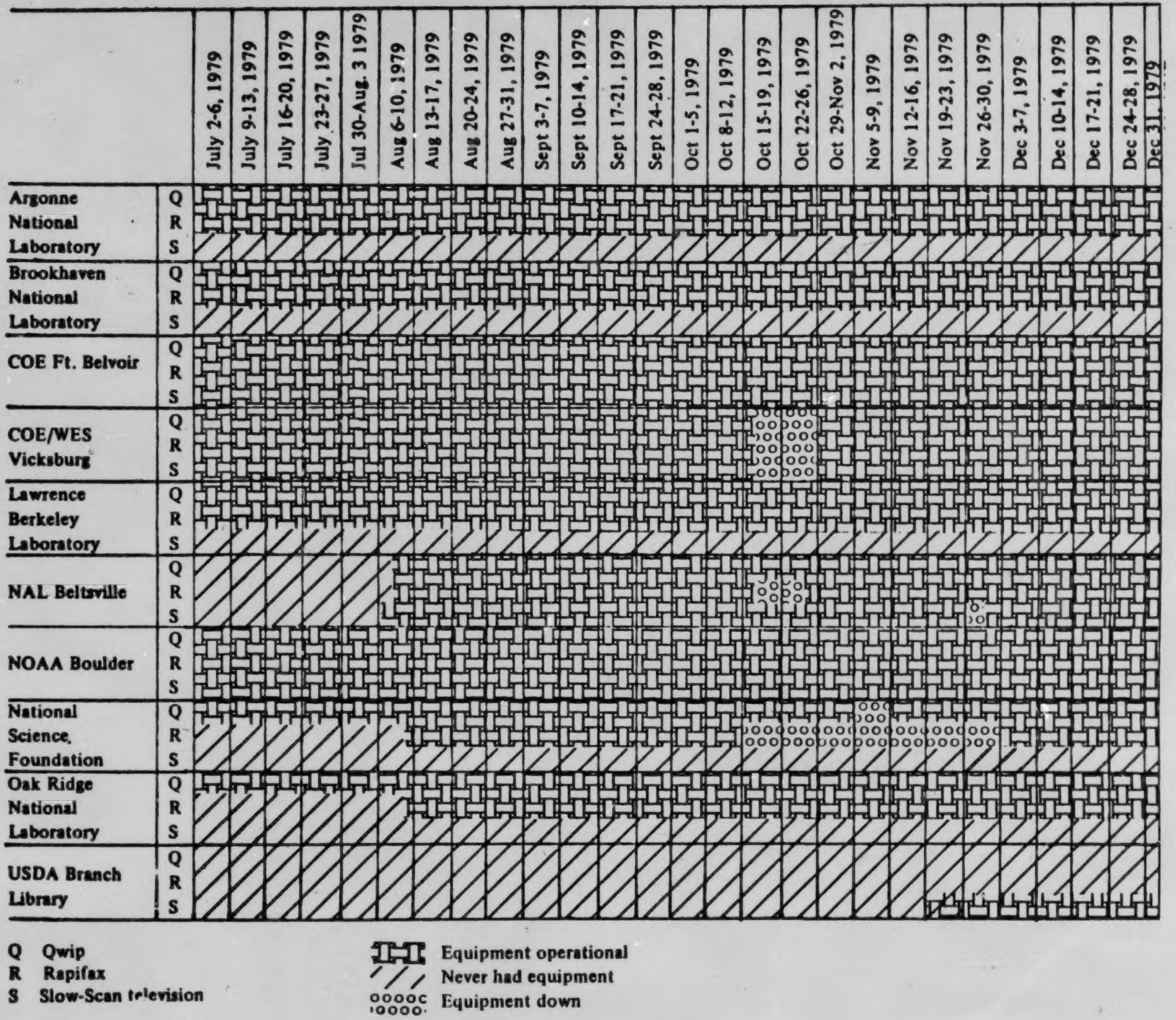

July 2-6, 1979
July 9-13, 1979
July 16-20, 1979
July 23-27, 1979
Jul 30-Aug. 3 1979
Aug 6-10, 1979
Aug 13-17, 1979
Aug 20-24, 1979
Aug 27-31, 1979
Sept 3-7, 1979
Sept 10-14, 1979
Sept 17-21, 1979
Sept 24-28, 1979
Oct 1-5, 1979
Oct 8-12, 1979
Oct 15-19, 1979
Oct 22-26, 1979
Oct 29-Nov 2, 1979
Nov 5-9, 1979
Nov 12-16, 1979
Nov 19-23, 1979
Nov 26-30, 1979
Dec 3-7, 1979
Dec 10-14, 1979
Dec 17-21, 1979
Dec 24-28, 1979
Dec 31, 1979
Argonne National Laboratory
Brookhaven National Laboratory
COE Ft. Belvoir
COE/WES Vicksburg
Lawrence Berkeley Laboratory
NAL Beltsville
NOAA Boulder
National Science Foundation
Oak Ridge National Laboratory
USDA Branch Library
Q
R
S
Q Qwip
R Rapifax
S Slow-Scan television
Equipment operational
Never had equipment
Equipment down

Figure 5

All libraries except the Department of Agriculture D.C. Branch Library did have both conventional (QWIP) and rapid (Rapifax) telefacsimile equipment. However there were significant delays in installing telefacsimile equipment in three libraries (it was not operational until August 1979 in NAL, the ORNL Library, and NSF Library) and briefer periods when equipment could not be used because it was moved, broken, etc. at COE, Vicksburg, at NAL, and at NSF. Figure 3, an overall chart of equipment in use, presents this information in graphic form.

Within each library, too, the equipment was installed in varying locations: some within view of patrons, some out of sight; some handy to the reference desk, some in offices in the back; some near the serials stacks, some a distance away; some next to the photocopying machine, some at a considerable distance. Such "positioning" of equipment also played its role by affecting ease of operation, patron awareness, and staff attitudes. In the ERL Library, the equipment was near the reference desk where someone was always present to hear a phone ring or see the results of a transmission.

In Vicksburg, the QWIP and RAPIFAX were located in a room out of sight of patrons and separate from the working area of the interlibrary loan librarians.

In the small Fort Belvoir library (one room in size), the equipment was in the reference area, in full view of patrons and close to staff working areas.

In Argonne, the equipment was located fairly near the key operator.

In Oak Ridge, the equipment was very close to the ILL staff, in an area adjacent to their desks, but far from the photocopier and out of sight of the patrons.

In Brookhaven, the equipment was several rooms away from the desk of the key operator. Although near the photocopier, it was not near any desk where people could hear a phone ringing or see material being transmitted.

In Berkeley, the equipment was several rooms away from the desk of the operator and some distance from the photocopier.

In the National Science Foundation, the library was all in one big room, rather like the one at Fort Belvoir. However the telefacsimile equipment was screened from patron view, tucked away in the technical processing section.

In the National Agricultural Library, reference and patron areas are on the first floor. The equipment, however, was all on the third floor in the Lending Branch section.

In the Agricultural Branch Library in D.C., the SSTV was located within the library's general reference and reading room.

Due in part to such problems as equipment installation, it is apparent that during Phase II, the faltering start that delayed the pilot stage of the experiment was repeated. Once again, the initial enthusiasm of participants was dampened by mechanical delays and by renewed misunderstandings regarding equipment placement and operation.

D. Promotional Efforts Directed to Patron Population

It appears that significant promotional effort was expended during Phase I, the experimental phase of the Project. Leyman in his Preliminary Analysis of the Pilot Stage reports that:

> "All of the libraries made special efforts to announce the new services very widely. Posters, memoranda hand-distributed to all employees, announcements in library bulletins, and features in agency

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> newsletters were used. Some of the libraries had installed the equipment in areas of the facility that were open to the public, which further drew the attention of patrons... Demonstrations were offered to interested parties, and two of the libraries held sessions for a total of 100 or more people at their respective sites."

For Phase II, promotional activities varied from library to library. As far as the six libraries that had already participated in Phase I were concerned, ERL Library continued to promote the Project by contacting various scientists and asking them to fill out SSTV interview forms indicating their potential interest in scanning bibliographies or journal contents in their field of interest, and in the use of SSTV for courses or for contacting colleagues at other locations. From August 6 to October 2, 1979, 28 persons were contacted. Various demonstrations of SSTV equipment were held, and interviews were conducted. A total of 24 evaluation sheets were filled out, some in response to demonstrations during May (Phase I) and some during interviews. Brookhaven, Berkeley, and Argonne did not have SSTV. As far as we can tell, they made no effort to promote the telefacsimile equipment actively to their patrons during Phase II.

The Corps of Engineers at Vicksburg told us that they made a big push in Phase I to advertise the Project with flyers, news bulletins, and open invitations to inspect the equipment. Very few persons responded and the library made no further attempt to advertise during Phase II.

In Fort Belvoir, however, perhaps because the equipment was located in full view of library patrons, the staff continued to discuss the Project with persons coming into the library.

As for the libraries which joined the Project as new participants for Phase II, the Director of the National Science Foundation Library told us that he did not promote the equipment. He said, "I could have drummed up a lot of business [artificially] if I'd wanted to, but the idea was, use it if it were useable... mostly it wasn't." He told us that interest at NSF was "nil."

In Oak Ridge, there was no advertising, the patrons were not aware of the equipment, and unless a patron requested a RUSH document, the library did not explain the Project and its uses to them.

The Director of the U.S.D.A. Technical Information Systems, National Agricultural Library, said that he gave much publicity to the Project. He said people came to look at the equipment but that they didn't do anything with it. The equipment was not accepted by his staff, and presumably, not promoted by them. However, NAL is located in Beltsville, Md., at some distance from the USDA Administration downtown. Its Branch Library in Washington did try to promote SSTV very heavily. They set up meetings to demonstrate its use, they had questionnaires to be filled out, and they sent out 59 letters and made six phone calls to patrons in order to promote their SSTV equipment. They received 19 responses from patrons; 21 persons attended the four demonstrations of the SSTV that were held during December 1979 and January 1980.

SECTION IV

EVALUATION OF PHASE II

A. Procedures Followed for Evaluation

For the conduct of the evaluation, Herner and Company had proposed to the Federal Library Committee to carry out six general procedures. They are:

1. Site visits to the federal libraries at the following locations:

    Argonne National Laboratory
    Brookhaven National Laboratory
    Environmental Research Laboratories
    Lawrence Berkeley Laboratory
    Oak Ridge National Laboratory
    Engineer Waterways Experiment Station (Vicksburg)
    Coastal Engineering Research Center Library (Ft. Belvoir)
    U.S.D.A. Technical Information Systems, National Agricultural Library, Beltsville and its Branch in Washington, D.C.
    National Science Foundation

    The purpose of the site visits was to inspect and discuss the extent and potential applications of telefacsimile and slow-scan television, and other interlibrary communication techniques at these agency libraries.

2. Analysis of (a) the cause of motivation of requests by originating libraries, (b) the uses made of different types of materials received, (c) the alternatives to incoming telefacsimile and/or slow-scan television transmissions among the recipient libraries.

3. Visits and/or discussions with (a) all members of the Oversight Committee, (b) other experts suggested by individual Committee members, and (c) other individuals.

4. The investigation of the use of slow-scan television in a training situation, a pilot project to be conducted between ERL Library in Boulder and a participating library in the Washington, D.C. area to determine the feasibility of using slow-scan television as a medium for training in special techniques (e.g., cataloging and use of OCLC).

5. Analysis, synthesis, and interpretation of the qualitative and quantitative data and insights garnered via the foregoing steps and the preparation of a report covering (a) the existing and near- and far-term uses of telefacsimile and slow-scan television in interlibrary communications, (b) the existing and potential relationship of telefacsimile and slow-scan television to other techniques and technologies such as COM and video cassettes, (c) the technical efficacy, advantages, and cost effectiveness of telefacsimile and slow-scan television as compared to conventional and other avant-garde methods of interlibrary communication, (d) delineation of implications and recommendations with respect to (1) the existing and potential utility of telefacsimile and slow-scan television, and other techniques and technologies in interlibrary communications, (2) the activities or programs necessary to make these utilities viable, and (3) additional required or indicated studies in these areas.

Procedure of Site Visit.--Herner and Company visited each participating library within the network. The purpose of these visits was two-fold.

1. To examine each site and record general information regarding the library, its mission, its staff, its facilities, and the place of this experiment within the library's environment.

2. To interview at each library the library director, the key individual responsible for the Project, and the equipment operators according to an interview protocol that both assured that the same designated topics be covered at each site and permitted open-ended questions that could lead to discussion and the free exchange of information and ideas.

A phone call was made to the library director at each site, explaining this purpose, requesting his or her cooperation, and scheduling the visit. Follow-up letters were sent confirming the visits. Members of Herner and Company who made those site visits were Lois Lunin, Marianne Moerman, and Nancy Wright. They were extremely impressed by the high degree of cooperation and friendliness which they received, as well as with the openness, hospitality, and unhurried length of time each individual contributed to the on-site interview.

Visits were scheduled as follows:

ERL, Boulder	January 7-11, 1980
Brookhaven National Laboratory	January 22, 1980
Lawrence Berkeley Laboratory	January 31, 1980
COE, Fort Belvoir	February 4, 1980
Argonne National Laboratory	February 6, 1980
Oak Ridge National Laboratory	February 7, 1980
COE, Vicksburg	February 14, 1980
National Agricultural Library, Beltsville	March 4, 1980
National Science Foundation	March 6, 1980
U.S.D.A. D.C. Branch Library	(Preliminary Visit December 26, 1979) March 14, 1980

During the visits which lasted anywhere from six person-days at Boulder to one day at most other locations, three principal activities were carried out: (1) conducting interviews with all personnel who participated in any way on the Project; (2) noting the location of the equipment with respect to the reading room, the stacks, the photocopy machine, the desk of the key operator of the telefacsimile and slow-scan television equipment, the general activity and traffic near the telefacsimile equipment (that becomes important when messages or communications are to be sent on QWIP and someone must hear the phone ring and answer it in order to receive the message that is to be transmitted); and (3) gathering the transaction forms that had been completed during Phase II. General discussions were held with the participating staff on the role of telecommunications in the library today and tomorrow, current staffing, other library resources available in the community, and general interlibrary loan activities.

B. Site Visits

In general, discussions with staff members at the 10 libraries showed general agreement among participants concerning several aspects of the Project. Because of this consensus, the information is summarized and appears below rather than in the description of each participating library which will appear directly after this summary.

Procedures Followed

- The project involved more paper work than the existing staffs felt they could handle. By its very nature, the equipment was labor intensive, requiring either photocopying prior to telefaxing or time to set up and use the slow-scan television equipment.

> Use of the transaction forms required for the conduct of the study was also labor intensive.

Equipment

> All participants preferred the Rapifax to the QWIP because it was faster to use, easier to use, and made better copies.

> Although the libraries with slow-scan television equipment found little use for the equipment, most of the librarians felt that in theory, the equipment offered great potential.

Networking

> Many participants felt that the interaction of people was the best part of the Project. If the Project worked well, they felt it was because of the enthusiasm and cooperation of the participants.

> Many librarians commented that it was helpful to learn for future use the nature of the collections of other libraries.

The following paragraphs describe the parent organization, its library (the Project participant), and offer some anecdotal information about activities or opinions that seemed unique to that particular library.

Description of Library and Anecdotal Information Obtained During Visit.--

1. The Environmental Research Laboratories Library, NOAA, is headquartered in Boulder, Colorado. In addition to NOAA's Environmental Research Laboratories, the Boulder Laboratories contain portions of the National Bureau of Standards and the National Telecommunications and Information Administration. Fourteen buildings are located on a 200-acre site. NOAA also rents office

space on the University of Colorado campus. The Environmental Research Laboratories conduct research on the total environmental system, including the oceans, atmosphere, and the near space.

The library has a professional staff of six, a support staff of 14, and holdings that include 40,000 books, 52,000 technical reports, 900 serial titles, 21,000 titles on microfiche, as well as instruction manuals, working papers, and audiovisual materials. It covers a wide subject range: mathematics, physics, atmospheric physics, cryogenics, earth sciences, meteorology, plasma and space physics, and radio. The Boulder Laboratories maintain the technical library as a service to its scientific staff in supporting the Laboratories' research and technical programs. The main library is located in the Radio Building with a branch in Research Building 3. It works in partnership with specialized information centers such as the National Geophysical and Solar-Terrestrial Data Center, the Cryogenic Data Center, the Electromagnetic Meteorology Information Center, and the Joint Institute for Laboratory Astrophysics Data Center.

Because the Project Director, Dr. Joan Maier, is also the director of the library, this particular library became the headquarters of the Project. During the site visit and subsequently, the Project Director was most helpful in supplying copies of documents describing telefacsimile and telecommunications studies and file copies of memos and other correspondence concerning the Project. She stated that administratively it was "great to have fax, for it speeds communications, saves the use of formal channels, and is also good for a library to use in sending documents." Regarding teleconferencing, she feels that if hard copy is not supplied as a part of the system, such conferencing is not useful. She added that the Colorado Alliance of Research Libraries and libraries in the metropolitan Denver area would like to consider using a mini-computer and fax for a serials sharing network.

Members of the library staff appeared to be well versed in the uses of the equipment and to have positive feelings about the Project although most recommended several changes in equipment design and function. One member said that with the proper equipment, i.e., with improvements in [telefacsimile] design so that the equipment photocopies and sends in one step, federal libraries can utilize each other and share resources. Two staff members commented that they gained much knowledge about the collections and services of participating libraries, and they remarked that such a program could result in faster service if the responding library answered promptly. When asked if the experience was worthwhile, one member said "'yes' when everyone cooperated and 'no' when they did not." Another staff member said that the ERL Library's clientele did not necessarily receive better service, that normal turnaround time was affected because the library's regular procedures were revised to cooperate in the Project, and that more staff had to be involved to use the telefax procedure. Nevertheless, she felt that the Project was interesting and worth doing because of its future possibilities.

Two young people, the Project Assistant, and a recent library school graduate who assisted on the Project, were most enthusiastic about its possibilities. They conducted an active promotional campaign to make the researchers in the laboratories aware of the equipment and its potential for use. They placed posters in the halls in the building in an attempt to stimulate interest in the Project; they held demonstrations of the equipment; and one later interviewed the researchers who saw those demonstrations.

From late August to October, 1979, she asked 24 scientists to evaluate slow-scan television based on the demonstrations they saw. (She also obtained information about the scientists' primary scientific interests, their current projects, and their information needs.) Most of the researchers' comments concerned the possible uses of slow-scan television and suggestions for improving the design or procedures. These comments appear in Section V on possible uses of slow-scan television. In general, however, the scientists thought the equipment could be used for conferencing, for previewing materials to see if they should be ordered, for taking courses, and for sharing graphic information with colleagues. Also, researchers seemed interested in SSTV in the abstract, but at the time of the interview were unable to see how it applied to their programs. One researcher said that SSTV would be useful at the beginning of a project to screen documents of possible applicability.

The White House Conference on Libraries and Information Services was held during Phase II of the Project and the ERL Library demonstrated the use of telefacsimile by supplying information to people attending the Conference. The library also participated in other applications: teleconferencing in the Continuing Library Education Network and Exchange (CLENE), using SSTV in on-line literature searching, and verifying citations.

During the period of Phase II of the Project, the library staff preferred the use of Rapifax to QWIP and actively used the equipment for correspondence, memos, and interlibrary loan activity.

2. The Army Engineer Waterways Experiment Station Technical Information Center, COE, is located near Vicksburg, Mississippi. It has a professional staff of 14 and a support staff of 20. The library branch contains more than 225,000 items, including books, technical reports, periodicals, reprints, and

three types of microforms. It is comparable to a large university library capable of supporting research at the doctoral level in engineering. The collection serves the Waterways Experiment Station (WES), as well as the four Department of Defense Technical Information Centers at WES: Soil Mechanics, Concrete Technology, Hydraulic Engineering, and Pavements and Soil Trafficability. It is the central reference source for the Corps of Engineers, which serves the U.S. Army and is also the nation's principal water resources development agency. The collection covers engineering and scientific subject areas such as hydraulics, soil mechanics, concrete, weapons effects, mobility of vehicles, environmental studies, explosive excavation, pavements, and geology.

The patrons are researchers located throughout a complex of laboratories and offices scattered over 685 acres of ground. These include a hydraulic laboratory, a geotechnical laboratory, a structures laboratory, and an environmental laboratory. WES employs 1400 civilians and 35 military personnel.

Rapifax was the preferred equipment, though QWIP was found useful occasionally to send an ILL form or other short message. QWIP could be used to communicate with other libraries not in the Project (e.g., Mississippi State University Engineering School) but useful to the library. However, the machine is slow and clumsy in receiving, clumsy for handling quantity, and, although it is less expensive than Rapifax, it is more time consuming.

The staff liked the Rapifax and used it a great deal. They cited examples when it was particularly useful. In one instance an engineer needed an article in a hurry. Vicksburg telefaxed the message to one participating library which faxed back that they didn't have the item. The request then went to Argonne where the article was faxed back within two days. The library stated, "While it is good for routine requests, it is excellent for time-crunch items."

In another example, the head of the Station was planning a trip to the People's Republic of China. He was going first to Washington, D.C. and then to China. He wanted a recent Fortune article but was leaving in six hours. When he asked the library to help, they phoned Boulder with the request. Boulder found it, sent it by Rapifax, and the article arrived three hours after the request was made.

Slow-scan didn't work for them. The library felt that users at this station want hard copy. They want to take it with them to their offices which sometimes are 2 to 3 miles away. While SSTV is good in theory, the engineers won't come down and "preview" anything. They would rather get the article, screen it, and throw it away if it's not relevant. SSTV won't work in this setting.

Vicksburg did, however, use SSTV for one teleconference with an engineer at Ft. Belvoir to view a funding document and talk on the telephone. However it was said that SSTV would be better if you could get a moving face; the freeze frame is cold and impersonal.

3. The Coastal Engineering Research Center Library, COE, at Fort Belvoir, Virginia, is located on the third floor of the building that houses the scientists and researchers who are its patrons. It is a small library with two professional and three support staff; it has 5,000 books, 300 serials subscriptions, and 20,000 technical reports. The collection specializes in coastal engineering, hydraulics, shore protection, coastal flood control, model studies, beach erosion, coastal ecology, and navigation.

For our visit an arrangement had been made for the ERL Library to transmit over slow-scan television the printed results of a National Technical Information Service (NTIS) search. Bennie Maddox had asked for ERL's assistance in structuring that particular search, and was very pleased to receive this help. The demonstration illustrates one possible use of slow-scan television, that of explaining or directing training from one location in the country to another--the transportation of expertise via telecommunications where visual elements not recorded on paper can be viewed and discussed.

In talking about the slow-scan television, it was noted that one can't talk on the telephone while a new page is being transmitted onto the screen and that this limitation can interfere with good communication.

Dennis Bird, head of the scientific and technical information division, came to talk toward the end of the visit to discuss the positive potential he sees for slow-scan television. His comments are incorporated in Section V.

4. The Argonne National Laboratory, Technical Information Department, DOE, in Argonne, Illinois, is a large library with 17 professional and 21 support staff. It subscribes to 2200 journals and has holdings of 155,000 volumes and 800,000 unclassified reports. Special collections include AEC, ERDA, and foreign reports on nuclear science and engineering. The subject areas of the collection are nuclear science and engineering, physics, mathematics, chemistry, biological sciences, materials science, and energy and environmental sciences. Its patrons are researchers in science and engineering.

At Argonne there is a main library and several branch libraries. If one of the branch libraries requests a document, that request comes to the main library via interoffice mail; one day is required to get the request from the branch to the main library.

Three contractors administer Argonne National Laboratory: University of Chicago, Argonne Universities Association, and Department of Energy. They operate and carry out programs of the old Atomic Energy Commission (AEC).

The person who had been in charge of the Project at Argonne had died the day before our site visit. Because the Head Reference Librarian was familiar with the Project and had participated in it, most of the site visit time was spent with him.

In discussing the procedures involved in this Project, Argonne librarians felt that the Project required a lot of paper work as did several other librarians at other locations. Time was required on two counts: first, to keep the transaction forms, and next, to transmit a copy. To send a copy of an article, someone first had to make a photocopy. For a long journal article, it is faster for library staff to make a copy and put it in an envelope to mail than to feed the pages one by one into the telecommunications devices.

It was felt that telefacsimile equipment will improve, but no matter what the improvements, people will still have to make a commitment to resource sharing.

In spite of all the problems, Argonne felt that the Project is a great idea. Much needed information was found in the other libraries. It was suggested that an electronic serials list would be a further improvement in service. In Phase I, all EPA libraries had a union list of serials from 1977; included were EPA, FDA, NASA, NBS, NOAA, and Trademark Office.

When asked what ground rules were followed in making requests, i.e., what determined whether Argonne requested material from the University of Chicago and the University of Illinois at Urbana or through the Project, Argonne said that they ordered items through the Project if the information was needed in a hurry. Also, the selection of library depended on the subject of the request; if the request involved a difficult biological question, for example, then that request went to the National Agricultural Library. If Argonne was not in a hurry, and if the request was not unusual, Argonne followed its usual procedure for interlibrary loans and used one of the nearby resources.

5. The Brookhaven National Laboratory Research Library, DOE, is similar in scope to Argonne. Located near the center of Long Island in Upton, New York, the facility which was formerly under the Atomic Energy Commission is now operated by the Associated Universities, Inc. Thirty-five hundred people work on site, of whom 1500 are scientists who do research in physics, biology, medicine, engineering, environment, and energy. The collection covers physics, chemistry, mathematics, biology, medicine, nuclear engineering, instrumentation, and health. The library has six professional and six support staff. The library conducts much of its interlibrary loan activity with SUNY at Stony Brook, Long Island.

At Brookhaven, the telefacsimile equipment was used mostly to send and receive memos, correspondence, and information for interlibrary loans. They did not have slow-scan television equipment in Phase II.

There was one problem with QWIP: If there is trouble with the machine at the beginning of a transmission--such as paper getting wrinkled--you can't let the receiver know; you must go through the whole process because there is no abort button.

The library noted several difficulties encountered in this Project. While staff members felt that telefacsimile is terrific for offices and for the private sector, they felt that it is less useful in a library. In interlibrary loan, the two-step process (photocopying an article and then feeding the photocopy through the facsimile machine) imposes a burden, which is felt especially in the time of staff cuts. At Brookhaven a policy was established that an article more than 10 pages in length (later, five pages) was photocopied and then sent by mail, not by Rapifax.

The staff stated that at Brookhaven interlibrary loan requests were sometimes delayed because a copy of the request goes first to the branch library; the branch library makes a copy of the desired article; the copy is then sent by messenger to the main library,and sometimes there is additional delay before the main library sends it by telefacsimile to the requester. They suggested that the Project might have worked better if the libraries in the Project had been smaller, if the libraries had had more staff, or if there had been more special libraries participating.

6. The Lawrence Berkeley Laboratory, DOE, formerly was part of the A.E.C. The laboratory, located near the main campus of the University of California at Berkeley, is part of the University of California in the sense that the Regents of the University of California have the contract to "run the laboratory." The library has a professional staff of 14 and support staff of 15. There are three branch libraries; a courier travels between them two to three times a week. If material is requested from one library, then that library makes a copy and either puts it in the local mail for the courier to take to the main library or puts it into the U.S. mail. The library subscribes to 1080 journals, and has holdings of 22,800 books, 16,000 bound periodical volumes, and 61,000 titles of unbound reports.

The subject areas covered by the collection include energy and environment, earth sciences, nuclear science, electronics, physics, mathematics and computer sciences, biology and medicine, chemical biodynamics materials and molecular research, accelerator and fusion research, and mechanical engineering. Its patrons are researchers.

The equipment at Lawrence Berkeley (Rapifax and QWIP) is located in a room at some distance both from the desk of the person who operates the equipment and from the photocopying machine. The staff mentioned that the equipment is not compatible with other telefacsimile equipment such as the 3M 9600. However, they felt that Rapifax was useful to request documents, and even if the documents had to be sent to them by mail, that Rapifax was also useful to confirm that material would indeed be sent. The staff were concerned about the amount of paper work associated with the Project, and some questioned whether it was worth the effort and cost in machinery and staff time. During the Project, Lawrence Berkeley conducted a RECON search of material at Oak Ridge, using a slave terminal. Editorial processing activity also occurred between Lawrence Berkeley and Oak Ridge.

7. The Oak Ridge National Laboratory (ORNL), DOE. The Laboratory occupies 2900 acres near Oak Ridge, Tennessee and is operated for the U.S. Department of Energy by Union Carbide Corporation's Nuclear Division.

ORNL describes itself as a national energy laboratory; it has a staff of 5800. Its mission is the development of safe, economic, and environmentally acceptable technologies for the production and use of energy. Its efforts are concentrated in four areas: nuclear (fission) energy development; physical sciences research; biomedical and environmental research; and magnetic fusion energy development. There are also new programs in conservation and fossil energy.

The Library System is in the Information Division of the Oak Ridge National Laboratory. Its objective is to support current research and development at the Laboratory by providing scientific and technical materials and information services. To achieve this objective the Library System offers technical services and draws on the unique collections and services of the four libraries constituting the interdependent system. The Library System's combined collections include: 250,000 specialized books and journals, 800,000 technical reports, 4000 scientific and technical current journal subscriptions, 125 scientific-technical abstracting and indexing services, 95 commercially available computerized data bases, and the UCC-ND videotape collection.

The Central Research Library is located in the X-10 plant, and is the largest library in the ORNL system, supporting the Laboratory's scientific efforts through its broad scope of scientific and technical materials. The Fusion Energy Library (Building 9201-2 in X-12) is a highly specialized collection, primarily serving the Fusion Energy Division. Special emphasis is placed on report literature from plasma physics laboratories. The Biology Library (Building 9207, X-12) serves not only the Biology Division but supports other laboratory research projects through an extensive collection of biological, toxicological, mutagenic, carcinogenic, environmental and health-related materials. The Technical Library (Building 9711-1, X-12) serves the Engineering Technology Division, especially the Nuclear Safety Environmental Center. It specializes in engineering and management materials.

For interlibrary loan, ORNL uses the TWX to request and the mail to receive books and journal articles. They recently began to use the OCLC subsystem, and prefer it, since with TWX, the receiving library may stack a request for several days before retrieving the item, whereas with OCLC, the response occurs right away. ORNL got the OCLC subsystem last April on a trial basis; by June or July they were operational. Using their OCLC terminal, they can key in the title or author, then get the OCLC number, and then verify the desired citation. Next, they key in a code to request the location of the desired item and the system locates the citation. The system allows a selection of up to five locations to which the request can be sent; the request is sent automatically. They can also ask for a work form in order to request a journal article. Because there are no serial holdings in OCLC, it is necessary first to check with the Union List of Serials or some other source to determine locations; they can then fill in the journal article information on the work sheet and request the selected locations in OCLC. The first library has three days in which to reply; to say "yes" it will send, or "no" it won't send. If "no," the request goes automatically to the next library selected. If that one can't supply the request, it may say it cannot, or it may say that it will supply the material later. The five libraries can be reached in a maximum of 15 days. The library felt more enthusiastic about their use of OCLC and its advantages over the old TWX and mail system than they did about the Project.

Concerning the telefacsimile equipment, the staff did not like the QWIP for several reasons, namely, because it is more time consuming to use, its resolution is poor, it does not hold paper well, and the small print in some journals reproduces very poorly. The staff, however, did have an interesting story to tell about the use of QWIP just before the Rapifax was installed.

A scientist was doing some work in California. He needed to send some data to Oak Ridge before he returned there. He found a QWIP II machine at an Exxon or Standard Oil installation. He transmitted his data quickly to Oak Ridge where it was fed into the computer; results were obtained, which were then transmitted to him so that he could know how to adjust his experiment in California and run it again before returning to Oak Ridge. He was very pleased with the speed of the response.

As for the Rapifax, the people operating the equipment felt that the real problem occurs when there are multiple pages to send. The automatic feed did not work on the equipment. This was the case for all the participants in the Project, and all commented on it. The Oak Ridge operators said that if they have 60 articles to transmit in one day, they can't stand at the machine and feed it all the time; the result is that with many articles, the library responds by mail because it is easier on the staff. There is no problem with the automatic arrival of requests, only with automatic sending.

Oak Ridge, as other libraries in this Project, sometimes had to obtain a requested document from a branch library. Usually the request was filled and mailed by that branch unless the requester specifically asked for Rapifax transmission. In that case, the branch library put the copy on a two-times/week pick-up truck that took the document to the main library which would then send it by Rapifax to the requesting library.

When asked whether their users were aware of the experiment and the equipment, the staff replied that the patrons were not aware of this Project. There was no advertising of the Project at Oak Ridge. Unless the patron requested RUSH, the library did not explain the project. If it was a RUSH request, the staff used the Project's facilities and sometimes told the user. If users received something very quickly, they often asked how it arrived and then would be told of the Project.

8. The National Agricultural Library, Technical Information Systems, Science and Education Administration, U.S.D.A. is located in Beltsville, Maryland, and occupies its own 13-story building. It has three branch libraries: the D.C. Branch and the Law Library are adjacent to each other in the Department's South Building on Independence Avenue and 14th Street; the National Arboretum Branch Library is located in the Arboretum Administration in Northeast Washington. Twelve field libraries are located nationwide.

The Library describes itself as serving the Department personnel, the worldwide agricultural community, other federal government agencies, land-grant universities, and the general public. The collection consists primarily of books and journals. It covers all aspects of agriculture: technical agriculture, farming, veterinary science, entomology, botany, chemistry, soil science, food and nutrition, agricultural products, rural sociology, and economics, statutes and laws pertaining to agriculture. To support the work of the Department of Agriculture, the Library also collects material in physics, biology, natural history, wildlife, ecology and pollution, genetics, natural resources, energy, meteorology, and fisheries.

The Library's staff includes 80 professionals and 114 support personnel.

Collection materials are acquired in all major languages, particularly Romance, Germanic, Slavic, and Oriental language groups. The Library also maintains a collection of historical books and manuscripts, with particular strength in botany, natural history, zoology, and entomology. Its holdings include 1,548,028 volumes, 10,000 microforms, reports, and maps, and 20,000 journals and newspaper titles.

The Lending Branch operates an extensive document delivery service in response to job-related requests to all Department employees. Books are loaned, journal articles are photocopied. Within provisions of the National Interlibrary Loan Code, books are loaned to other libraries, and orders for photocopies or microfilm are accepted.

Discussions were held with three people at NAL: the Administrator of the Technical Information Systems, and the heads of the Lending Branch and the Utilization Section.

The Adminnistrator found the equipment "intriguing," and stated that the library made some new contacts with other libraries in the Project. However, he assumed that after the completion of the Project, the library will return to its conventional interlibrary loan methods.

When new equipment is introduced, the most important consideration is its acceptance by staff. If the equipment is not accepted by staff, then it is useless. In this particular library situation, the equipment--its use, not its location--got in the way of the people doing the work; they did not see the use of the equipment as a short cut. To them, its use meant that they had to learn new procedures, deviating from the ones they had been following previously. As a result, they avoided using the equipment. It was indicated that "there is nothing wrong with the machines but, set in this kind of large, bureaucratic establishment with an established order, people don't change easily. And if you insist and upset the people, production falls." Production is important at NAL where photocopy requests reach 128,000 annually and everyone has deadlines to meet. One more factor complicated this situation: the major planner of the Project retired in August, 1979, just when Phase II began.

It was felt that slow-scan television could be ideal in a laboratory situation, for example, to show specimens. Despite publicity, the staff did not "warm up" to that equipment. The early retirement of the man who planned the Project may have had something to do with its lack of acceptance.

Three professional positions were vacant in the Lending Branch in NAL and no technical staff was available for the Project. There was concern about how the Project could fit into NAL's volume of work and into their assembly line. The department has a heavy workload (this is the unit responsible for all photocopying); processing begins at 10 a.m. and later-arriving requests requiring telefacsimile transmission make a negative impact on the production schedule. To NAL, the Project was a thorn in the flesh.

It was stated that the present technology is inefficient for an operation the size of NAL. Even with improvements in the technology, the process itself doesn't reduce the workload. In this project, "you are constrained into a network that may not best serve your purpose; you have to use libraries that you wouldn't go to as your first choice." In effect, the telefacsimile equipment at NAL was reduced to being used as a TWX. A request was received, the document was retrieved, and then the photocopy was sent via normal channels. It was felt that such equipment would be helpful to small libraries with less resources, like Fort Belvoir. If funds were no object, the equipment might be retained for emergency or scientific use.

Others thought the slow-scan TV would be useful for conferencing and that Rapifax would be good for handling items in an emergency. Those involved in the original planning of NAL's participation had thought the Project would be helpful to smaller libraries, but had been concerned about the impact of the Project where there was a great volume of work, as in the case of NAL.

9. The U.S.D.A. D.C. Branch Library is located in the Department of Agriculture Building in downtown Washington, D.C. The subject emphasis is agricultural economics, developing countries, personnel, and trade directories--nothing related to scientific and technical information.

Conversations were held with the Acting Chief of Operations and the Reference Librarian.

The library did not have telefacsimile equipment, but did have slow-scan television which was operational for approximately one month--December, 1979.

The library experienced problems in the installation of the equipment. The staff said they needed a special jack for the phone and they had to wait two months for it to be installed so that the SSTV became operational just shortly before it was removed. The first demonstration they gave was held the day before Herner and Company's first site visit.

The D.C. Branch Library is 16 miles from Beltsville. NAL constantly transfers materials to the D.C. Branch. The advantage of the SSTV is that the material does not always need to be charged out. The disadvantage is that a person is needed to operate the equipment. The staff liked the SSTV and the potential of what it can offer. One shortcoming they mentioned is that SSTV doesn't show action; SSTV will show only still pictures. However, a series of actions can be shown by a series of photos in "rapid" succession.

They cited an example of the use of SSTV. On November 1, they received a call from a firm in Canfield, Pennsylvania, which learned that the D.C. Branch Library had SSTV. When the head of the Branch Library needed to be in Harrisburg, he took with him a videotape to show SSTV. This videotape had been created by two people at ERL Library at the request of a member of NAL. The Pennsylvania firm was interested in using this technology on behalf of a client in Reading whose company had an office in New York City. A women's apparel firm, the company manufactured leotards and wanted to show them to their outlet in New York without having to travel.

It was suggested that you could use this equipment for shopping; Montgomery Ward, for example, could have pictures of merchandise on microfiche; the consumer could then select the item desired from the photo displayed on SSTV.

The library felt that good two-way communication is needed between the sender and the receiver so that the sender will know, for example, if the requester has indeed received the information.

At the D.C. Branch Library, SSTV was used for demonstrations only, for example, to show abstracts, photographs in journal articles, parts of an article. "But no one was interested. They all want something in their hands."

They had equipment problems during demonstrations which delayed transmission. "You say this will work fast, then the demonstration is slow and it turns people away. Although the equipment is simple to use, and you can focus it easily, this not a quick way to transmit ideas."

It was suggested that if there were patrons who need this service often, perhaps they could use it themselves. However, since the requester needs a person with a document at the other end, additional staff is needed even to telebrowse.

The two library staff members interviewed liked SSTV. One commented that it could be used together with telephone "call director" equipment into which any phone can be connected. "With SSTV," he suggested, "you can see the picture, the people. Add the names in front of them at a table, then talk by phone."

He said that this library promoted "the heck out of it," set up meetings to demonstrate its use, and wanted to use it with NAL in Beltsville, but that the people there didn't have enough time to operate the equipment. He added that libraries will have to transmit information electronically in the future, and he recommends that libraries continue to look at new and innovative equipment and systems.

One good thing came of their use of SSTV, he said. They built a special area in the library for meetings and the experiment helped them figure out how to design that room.

He thought SSTV was an exciting idea at first and was disappointed that it didn't turn out that way when they tried to stage their demonstrations. He suggested an Act of Congress to provide funds for federal libraries and thereby increase their service potential, especially with more outreach to other groups such as national farmers groups.

10. The National Science Foundation is located on G Street in Washington, D.C. and on 5200 Wisconsin Avenue near the District line (Washington-Maryland border). About 1200 people work in NSF. The library serves people within the agency and performs interlibrary loan services. It contains a small reference collection of 17,000 books, 350 bound periodical volumes, and subscriptions to 600 journals. There is a professional staff of three and support staff of two.

Discussions were held with the director of the library who is Privacy Officer and Records and Reports Officer and with two librarians. The NSF library does not need to be large because it is located in the midst of rich resources with easy access to the Library of Congress and libraries at George Washington University, the Department of the Interior, and the Office of Management and Budget. Anything the library needs, therefore, is close by. Scientists often go to George Washington University themselves rather than asking the library to obtain materials for them.

The library uses OCLC for cataloging and it is getting access to Lockheed data bases. NSF library has an indefinite loan period. They keep only general reference books in the library. They buy books or journals for scientists who can keep those materials on permanent loan. If someone else wants a book, the library borrows it from that scientist.

Like the D.C. Branch Library of NAL, NSF experienced delay in the installation of the equipment. For two months of the Project, the Rapifax was not in use because the phone company had disconnected the equipment; a coupler which was not voice-loaded was involved and that change required a new requisition.

They did not "force" the use of telefacsimile equipment. This is not because NSF is not used to having telecopiers. When the library was located on K Street, it got its first telecopier. The National Science Foundation is directed by The Science Board whose members come to NSF about two times a month; some members have telecopiers in their offices for communication. The present branch office on Wisconsin Avenue has a telecopier which it has been using for six or eight years. Once someone sent a 60-page proposal on the telecopier. The mail room of NSF presently has Xerox telecommunications equipment.

If this library were not centrally located, telefacsimile would be the way for it to go. There have been times when the library could not have functioned without a telecopier, which has been used for administrative communications. One full-time person would be needed to handle telefacsimile in an ongoing project because of the photocopying which is required as a first step in the process.

SSTV might be useful for conferences so that people can see each other. It would also be useful to show things such as merchandise. SSTV equipment at NSF was located in the office of Dr. Richard Lee; this equipment, however, was not part of the Project nor compatible with it.

C. Conduct and Analysis of Interviews and Discussions with Library Personnel at Participating Libraries

Interviews with library personnel at each of the participating libraries were conducted towards the close of Phase II. A member of the evaluation team acted as the interviewer and, as stated previously, made a personal visit to each location. Library staff gave the interviewer(s) a tour of the library, taking them to each department, introducing them to their colleagues, pointing out where the equipment was placed for use in the experiment, often demonstrating the equipment, and devoting a great deal of time and attention to their visitors. To ensure comparable and quantifiable responses, an interview guide, developed during the planning phase of the study, was followed (see Appendix C). Individual private interviews were conducted, according to the interview protocol, with the library director at each location, with any librarians and library technicians who were involved in the Project, and with all clerical personnel who operated the equipment.

An average of four persons per library were interviewed, for a total of 38 persons. The questions and discussion covered the use of the equipment, its operation, its staffing, its advantages and disadvantages, and the uses to which it was put; ideas for improvement of the equipment and its use; relationship with the other participant network libraries; services provided to patrons; and the effects of the experience on service.

Although the same questions were asked of all participants, it became clear that their responses were not in fact strictly comparable because of differences in equipment deployment, installation delays, level of promotion, and the like, that caused the nature and extent of certain libraries' participation to vary widely. For instance, all participants were asked questions relating to three types of equipment, but only three libraries had operational slow-scan television equipment for the duration of Phase II. Although the overwhelming preference for rapid telefax equipment expressed in the response to Q.10 is probably an accurate indication of the merit of this equipment for library uses (further indicated by the number of transactions that utilized this equipment in preference to other equipment), it must be remembered that some respondents were comparing rapid telefax only to conventional telefax, while other respondents were comparing rapid telefax to conventional telefax and slow-scan television. Nevertheless, interview findings are tabulated in Table 2 followed by a brief analysis of certain responses.

Table 2

TABULATION OF INTERVIEW FINDINGS WITH LIBRARY PERSONNEL

Q 3. Position Title of Interviewee

Head of Library	11
Librarian	11
Technical Assistant	11
Clerical Personnel	5
	38

Q. 6. Which Equipment Have You Personally Operated?

Slow-Scan Television	17
Rapid Telefax	21
Conventional Telefax	22
	60*

Q. 7. How Often Do You Use the Equipment?

SSTV, 1-5 times per week	1
SSTV, 1-5 times per month	6
Rapid Telefax, 2-5 times per day	4
Rapid Telefax, 1-5 times per week	9
Rapid Telefax, 1-5 times per month	4
Conventional Telefax, 1-5 times per week	5
Conventional Telefax, 1-5 times per month	10

Q. 8. Are You the Key Operator?

Yes	11
No	27
	38

Q. 9. Do You Train Other Staff Members on the Equipment?

Yes	6
No	23
Not applicable/No answer	9
	38

*Multiple responses permissible

Q. 10. Which Equipment Do You Prefer to Use and Why?

Slow-Scan Television		0
Rapid Telefax		30
Faster	15	
Easier to use	9	
No monitoring/phoning	7	
Clearer copy	6	
Generally superior	5	
More reliable	2	
No odor	1	
Staff prefers it	1	
	46*	
Conventional Telefax		0
Not applicable/No answer		8

Q 11. What Times of the Day Seem More Efficient to Use the Equipment?

Slow-Scan Television	
Before 8:00am	2
Before 10:00am	1
1:00-2:00pm	1
3:00-4:00pm	1
8:00am-2:00pm	1
8:00am-4:30pm	1
Not applicable/No answer	32
	39*
Rapid Telefax	
7:00-9:00am	4
9:00-10:00am	3
1:00-3:00pm	5
2:00-5:00pm	5
8:00am-2:00pm	1
8:30am-12:00pm	1
8:30am-5:00pm	1
10:00am-2:00pm	1
11:00am-2:00pm	1
Late Evening	2
Not applicable/No answer	16
	40*
Conventional Telefax	
7:00-9:00am	2
10:00-11:00am	4
1:00-2:00pm	1
3:00-4:00pm	2
8:00am-2:00pm	2
8:30am-5:00pm	2
11:00am-2:00pm	1
Not applicable/No answer	25
	39*

*Multiple response permissible

Q. 12. What Times Seemed Least Efficient?**

Early Morning	2
8:30am-12:00pm	3
9:00am-1:00pm	1
Mid-day	2
10:00am-3:00pm	4
11:00am-2:00pm	2
3:00pm-5:00pm	3
Late afternoon	3

Q. 13. Have You Used the Automatic Features of the Rapid Telefax?

Yes	14
No	7
Not applicable	17
	38

Q. 14. What Improvements in Design Would You Recommend?**

SSTV		19*
Too slow	4	
Transmit whole page	3	
Not applicable to libraries	3	
Too big	2	
Better image resolution	2	
Improve the plugs	2	
Add rotating monitor	1	
Needs memory	1	
Add hard copy option	1	
Rapid Telefax		23
Eliminate xeroxing	7	
Improve automatic feed	6	
Better image needed	6	
Too slow	2	
Improve multiple copying	1	
Unreliable/bad service	1	
Conventional Telefax		29
Better image resolution	9	
Noisy and smelly	6	
Too slow	5	
Improve paper clamp	4	
Eliminate xeroxing	2	
Too slow to load	1	
Add automatic feed	1	
Needs better paper	1	

*Multiple response permissible
**Response not required

7~

Q. 15. Do You Feel That Your Contact with Other Libraries Has:

Increased	22
Decreased	0
Remained the same	12
Fluctuates	1
Not applicable/No response	3
	38

Q. 16. If Increased, Do You Believe That This Has Resulted in Better Service?

Yes	17
No	5
	22

Q. 17. If Decreased, Why?

No responses in this category

Q 18. Do You Expect to Continue Interlibrary Loan Transactions With The Participating Libraries at a Level Equal to or Greater Than During the Project?

Yes	15
No	10
Don't know	10
Not applicable/No answer	3
	38

If "No," Why?

Will return to regular channels	4
Lack of equipment	3
Has placed too great a load on some participants	1
Project has created false patterns	1
No response	1
	10

Q. 19. What Uses Besides Document Delivery Did Your Library Make of:

SSTV		25*
Teleconferencing	6	
Training	3	
Online literature searching	3	
Other demonstrations	9	
-memos/correspondence	2	
-telebrowsing	2	
Rapid Telefax		20*
Teleconferencing	1	
Training	2	
Online literature searching	4	
Other demonstrations	1	
-memos/correspondence	12	

*Multiple response permissible

Q. 19. continued

Conventional Telefax		13*
Teleconferencing	4	
Training	1	
Online literature searching	2	
Other demonstrations	2	
-memos/correspondence	3	
-data transmission	1	
Not applicable/No answer		13

Q. 20. If Funds Were No Object, Would You Recommend that the Library Retain:

Slow-Scan TV	6
Rapid Telefax	28
Conventional Telefax	11*

Q. 21. (For Library Directors) Do You Plan to Budget For:

Slow-Scan TV	
Yes	0
No	9
Not applicable/No answer	2
Rapid Telefax	
Yes	5
No	3
Not applicable/No answer	3
Conventional Telefax	
Yes	1
No	7
Not applicable/No answer	3
Other Narrow-Band Equipment	
Yes	0
No	3
"Interested"	1
Not applicable/No answer	7

Give the Reasons Behind Your Decision

Recommended by staff	1
Not accepted by staff	1
Similar equipment available elsewhere	2
Not justified by level of use	1
Speeds communication	1
(conventional telefax) transportable, easy to maintain	1

*Multiple response permissible

Q. 22. Have You Shared the Equipment with Other Elements in Your Agency?

Yes	11
No	21
Not applicable/No answer	6
	38

If Yes, Cite Examples

Scientists sent material to Washington	3
Rush correspondence	1
When other branch's equipment was broken	1
Demonstration for computer dept.	1
Used for contractors	1
Examples unclear	4

Q. 23. Have You Extended Service to Researchers Not Sponsored by Any of the Agencies Supporting the Participant Libraries?

Yes	5
No	30
Not applicable/No answer	3
	38

If Yes, Cite Examples

Used by another local library	2
Local university students and faculty	1
Phase I-Maine State Libraries	1
TALINET Project	1

Q. 24. Do You Believe the Project Experience Has Been Worthwhile with Regard To:

a. Sevice Improvement:	Yes	25
	No	10
	N/A	3
b. Personal Development:	Yes	29
	No	7
	N/A	2
c. Network Development:	Yes	23
	No	10
	N/A	5
d. Cooperative Use:	Yes	12
	No	10
	Undecided	6
	N/A	10
e. Service to researchers:	Yes	10
	No	9
	Undecided	7
	N/A	12

Q. 25. Has Your Participation in the Network Affected the Acquisitions Decisions You Have Made?

Yes	2
No	20
Not applicable/No answer	16

Q. 26. What Areas of Staff Expertise in Other Network Libraries Were Used During The Project Not Available to You Locally?**

Document Location	3
Online searching experience	3
Subject expertise	2
Reference Services	2

Q. 27. Has Your Justification in the Network Affected Your Staffing Decisions?

Yes	5
No	13
Not applicable/No answer	20
	38

Q 28. Other Comments**

Enjoyed working with the equipment and the other libraries	10
Would prefer more communication among participating libraries	2
Idea is good but technology needs improvement	2
Procedures should have been standardized	1
Equipment got in the way of the people doing the work; no short cut	1
More beneficial for small libraries than for large ones	1
Test did not last long enough	1
Should have had complete holdings list	1

**Response not required

In response to Q. 6, 12 respondents indicated that they had not actually operated any of the pieces of equipment. Non-operators included six of the 11 head librarians, four librarians, and two technical assistants. All libraries had a minimum of two or three persons who had been instructed in the operation of the equipment. At least two persons at each participant library had received training on the equipment remotely from the Project Assistant in Boulder. Some of the equipment operators had been trained directly by the equipment manufacturers' representatives, who then passed their knowledge on to others. As was to be expected, clerical or technical staff operated the equipment at the larger libraries, while librarians (even, in one case, a library director) were also involved in the daily operation at locations with small staffs. Equipment operation was, in every case, in addition to a staff person's regular library duties.

In response to Q. 7, only the National Agricultural Library, Beltsville, scheduled its hours of operation. This was necessitated by NAL's extremely heavy volume of interlibrary loan activity. All other sites had staff available to operate the equipment daily throughout the normal working hours of the library.

Of the key operators identified by Q. 8, three were librarians, four were technical assistants, and four were clerks. Whether respondents were operators, key operators, or non-operators, all who answered Q. 10 expressed a preference for rapid telefax.

Interviewers realized that Q. 15 was ambiguous, since there were no baseline data studied in either phase of the Project, and because there was no consistent interlibrary loan procedure implemented at all locations throughout the study. Although some libraries may have made an effort to obtain materials through the Project, thereby increasing their contact with other libraries, some participants may have continued to rely upon their customary channels and sources. Five respondents who indicated that library contact had increased also said that this increase had not necessarily resulted in better service to their patrons (Q. 16), because most of the increased activity was outgoing. One participant commented that service to patrons, had, in fact, declined because normal, fast procedures had been revised for the duration of the Project. The five respondents commenting on the lack of improved service were located at five different libraries which varied considerably in size and extent of network participation (Brookhaven, ERL, Argonne, NAL, and NSF).

Six respondents would recommend that their libraries retain SSTV if money were no object (Q. 20). These respondents included one head librarian, three librarians, and two technical assistants; only one of them was the key operator. It is interesting that reasons for retaining SSTV included an interest in satellite usage, conferencing, and other experimental telecommunications applications. None mentioned library applications or telebrowsing. Twenty-eight respondents recommended retention of rapid telefax, including seven head librarians, eight librarians, 10 technical assistants, and three clerks; eight were key operators. Of the 11 respondents who would retain conventional telefax, two were head librarians, two librarians, six technical assistants, and one was a clerk; only one was a key operator. The reason most often given for retaining the conventional telefax was its widespread usage among all libraries.

Those who thought the Project had been worthwhile with regard to service improvement (Q. 24), included seven head librarians, four librarians, 10 technical assistants, and four clerks; whereas four head librarians, four librarians, one technical assistant, and one clerk found no service improvement value in the

Project. In regard to personal development, seven head librarians, seven librarians, 10 technical assistants, and five clerks (100%) thought that the Project had been worthwhile; while three head librarians, 3 librarians, and one technical assistant thought that it had not.

Two respondents, both head librarians, said the participation affected acquisitions decisions for their libraries (Q. 25). One commented that subscriptions were being analyzed to determine if network coverage of expensive journals could enable the library to cancel some titles.

Of the five respondents who said that participation had affected staffing decisions (Q. 27), (three head librarians and two librarians), one remarked that the study had been considered sufficiently significant to adjust positions, although not sufficiently significant to justify new personnel.

D. Analysis of Telephone Interviews with Patrons

Upon completion of the Project, all transaction forms were collected and each originating transaction was connected with its response. It was thus possible to select transactions where a request had been fulfilled. All library patrons who were successfully served by the network during January, February, and March, 1980--the final three months of Phase II (in effect, during the extension period)--were selected for the conduct of the telephone interviews. Since the National Agricultural Library and its D.C. Branch in Washington did not participate during the extension period of the final three months, all patrons who received service through NAL during December, 1979 were selected. It was considered unlikely that patrons would remember instances of service that had occurred much earlier.

Telephone interviews were conducted by a trained and experienced interviewer, according to an interview protocol (see Appendix C). Questions were concerned with whether the patrons were aware of the equipment used to transmit their requests and its response, whether they were satisfied with the service they received, whether this service was useful, and whether delivery of the response was timely. A total of 100 patrons were selected for these telephone interviews. Of these, we were successful in contacting 82 (see Table 3).

Table 3

SAMPLE OF PATRONS SELECTED FOR INTERVIEWS

Project Libraries	Patrons Selected	Patrons Contacted
ERL, Boulder	39	33
COE, Vicksburg	31	28
COE, Ft. Belvoir	6	5
Argonne	3	3
Oak Ridge	5	5
Brookhaven	0	0
Lawrence Berkeley	6	6
NSF	0	0
Agriculture,Beltsville	10*	2
Agriculture, D.C.	0	0
TOTAL	100	82

*Eight of the 10 patrons had received successful service by the network but both the originating and responding transactions involved only the U.S. mail. These patrons were not telephoned.

Patron Characteristics.--In understanding the information needs and uses of the patrons, it is helpful to know something of the educational background and principal job activity. The highest degrees of the patrons interviewed are as follows: bachelor's degree--23, master's degree--24, and doctoral degree--32. Their fields of highest degree varied widely:

Physics	23	English	2
Engineering	14	Soil Science	1
Geology	7	Forest Science	1
Biology	6	Wildlife Ecology	1
Oceanography	3	Environmental Science	1
Mathematics	3	Climatology	1
Psychology	2	Library Science	1

Primary job activity ranged from laboratory research to management, from information research to public relations. Forty-eight were laboratory scientists, 10 spent all or most of their time in management, eight were involved in mathematical analysis and computer handling, five were information researchers, and the balance were involved in a variety of activities ranging from problem solving and data handling to public relations.

Interview Data.--Table 4 shows the questions that were asked and the summary of the replies obtained. Responses were recorded and then tabulated and analyzed.

Table 4

TABULATION OF INTERVIEW FINDINGS WITH LIBRARY PATRONS

Total number of respondents: 82

Q. 1. What documents did the library provide for you?

Journal articles	71
Books	3
Newspaper articles	1
Report	7
	82

Q. 3. For what particular purpose did you need this information?

Research	49
Writing books or papers	17
Information support to others	12
Current awareness	2
Proposal Writing	2
Presentation of material	2
Teaching	1
	85*

Q. 4. Did you find that the information you received was, in fact relevant to your request?

Yes	59
No	5
Of limited relevance	5
Don't know	7
	76

Q. 5. With regard to the timeliness of the service, did you receive the information or materials you requested?**

On time	49
Earlier	7
Later	16
Don't remember	7
	79

Q. 6. If later than requested: did the lateness of the response have any kind of adverse effect on your work?

Yes	6
No	10
	16

*Multiple response permitted
**Five did not specify a limit

Q. 7. Was the promptness of the response beneficial to you in any way?

Yes	42
No	7
	49

Q. 9. Were you aware at the time you made the request that the service would involve slow-scan television equipment?

Yes	5
No	74
	79

Q. 9. Were you aware at the time you made the request that the service would involve the use of telefacsimile equipment?

Yes	7
No	72
	79

Q. 10. Did you subsequently become aware that the service was provided through the use of this equipment?

Yes	7
No	65
	72

Q. 11. On any previous occasion, have you had experience or have you been provided service through the use of telefacsimile?

Yes	17
No	28
Don't know	35
	80

Q. 12. On any previous occasion, have you had experience or have you been provided service through the use of slow-scan television?

Yes	0
No	18
Don't know	20
	38*

Highest Degree of Respondents

High School	0
Bachelors Degree	23
Masters Degree	24
Doctoral Degree	32
	79

*Only 38 interviewees were asked this question.

Purpose for Seeking Information (Q. 3)

The purposes for which these people had sought information were varied: for their research (49), for writing papers or books or for reviewing papers or books (17), for providing information support to others (12), for current awareness (2), for proposal writing (2), for presentation of material (2), and for teaching (1).

Relevance of Information Received (Q. 4)

Was the material delivered relevant? This question is important to the Project and to all interlibrary loan procedures no matter how the information is delivered. Fifty-eight said the information received was relevant but the comments offer far more grist for insight than the number.

> "30 percent of the documents were applicable--this is expected; shotgun approach."
>
> "Exactly what I was looking for; I had read an abstract and knew that the materials would be useful. Like the interlibrary loan system--it works well."
>
> "One was, the other was not."
>
> "Yes, I had abstracts, so I knew what I was getting."
>
> "Relevant to my request, but not what I actually needed."
>
> "Sure, exactly what he wanted."
>
> "Yes, basically I knew what was in the papers. I knew the authors."
>
> "Yes, I knew contents, but lacked the document."
>
> "To a limited degree. This request was part of a 'shotgun' effect. We were hoping to add new material."
>
> "In varying degrees yes; some very relevant, others tangentially related to what you are doing."
>
> "Yes and no. You never get everything you hope that the article contained."

> "Yes and no. The simplest way to distinguish is to look at the paper. You run across citations that you should at least look at. The good ones are kept, the others are returned."
>
> "Of limited relevance."
>
> "It wasn't exactly what we were looking for--partially useful."
>
> "Yes, but it wasn't the right case, it was very close."
>
> "Interesting, but not necessary."
>
> "The material is sitting on my desk and I haven't had time to look at it."
>
> "Can't recall. There is a 50/50 chance that it was used."
>
> "Can't remember. We usually just index them, from the title, it probably was useful."

On this same subject it is interesting to note that patrons at Vicksburg indicated a 3:1 ratio for relevance:nonrelevance. Twenty-one said the information received was relevant, seven said it was not. The institution with a large number of users was ERL. There the ratio was 2:1 for relevant:nonrelevant articles. Twenty-three said the information was relevant while 10 said it was not.

Timeliness of Response (Q. 5)

Speed is another factor important to this study. Forty-nine said the material arrived on time (it is important to keep in mind here that many patrons did not specify time--had not given dates or deadlines, and were not in a hurry for the information). That is rather interesting in view of the comments in the preceding section that they wanted material while the idea was hot or fresh in someone's mind. One informative comment on timeliness follows:

> "Most of what we get is borrowed because our library is limited. Two to three weeks is average turnaround. NTIS

> documents are generally longer. It is difficult to assess whether or not something is timely since we must order virtually all our materials from other libraries (because of our limited collection) and since we take this into consideration."

Seven patrons said they received material earlier than requested, 16 said they received it later than requested and seven said they didn't remember. Of those who received material later than requested, the following comments are enlightening because they show that this lateness often had nothing to do with the library.

> "Part of the problem was local communication. They received the document rapidly but couldn't reach me by phone, since I was in the laboratory."
>
> "Faxed request only--the book was too large to fax back."

When asked whether the lateness had an adverse effect (Q. 6), only a few patrons commented:

> "Proposal was due on a certain date. These articles didn't make that date. It took me time to find references, so I'm partly at fault."
>
> "Field experimentation is very expensive. Literature helps us prepare for this, what we can expect, whether anyone has done this research and what type of problems they had. Unfortunately, our ILLs often take months, and this is expensive in terms of mistakes. There are delays on base here with our own mailing/central distribution office. Sometimes our routing procedures are the problem."

Of those instances in which the patrons said promptness was beneficial, the comments were rather lukewarm.

> "Adequate only."
>
> "Did not make much difference in this case. Other times the promptness did help."

When asked "How did receiving this response benefit you?" (Q. 8), their answers included the following comments:

> "Was able to make preliminary assessment."

Several comments concerned the opinion that the faster the information arrives, the more likely one is to use it and the longer it takes to arrive, the less likely one is to want it when it does arrive.

> "You tend to forget why you wanted something when it arrives too late unless you take the trouble of keeping a log book."
>
> "Helps keep projects on schedule. One gets used to things arriving on time (2 weeks) and you tend to plan for this."
>
> "In the sense that what I wanted it for was fresh in my mind. Often you forget why you requested something when it arrives late."
>
> "You tend to forget why you ordered something if it arrives late from the library. In other words, an article will arrive that isn't directly related to earthquake destruction, and you will have forgotten why it was originally ordered."
>
> "When I'm working on this kind of thing, I have to get the material in a short period of time or I lose interest. You must strike when the iron is hot. I never would have written the article without fast turnaround because I would have lost interest, or at least moved on to something else."

Other comments concerned the need for the information as directly related to the research.

> "We wanted to decide whether to use the method we were considering for research. The faster we made this determination the quicker we can get research underway."
>
> "Planning was easier, prevented unneeded work."
>
> "Something weird was happening in one of our experiments. We were sitting on the edge of our chairs waiting for this article, because it explained the phenomena."
>
> "In both instances we found follow-up articles, from the avalanche effect. Each primary source spurs a chain reaction effect. This literature compilation process is used for all research projects, and the first or primary sources are the most important to receive on time."

General Comments

When the patrons were asked whether they were aware of the use of telefacsimile, of those who answered yes, a few replies are of interest in relation to the limitations of the equipment.

> "Very poor copy quality had made me suspect yes. Doesn't produce very legible permanent copy."

Many users did say that they use telefacsimile for other purposes; for example, to communicate with other parts of their agencies. One said it was one of their basic forms of communication.

E. Results of Tabulation of Data; Analysis of Data

Overall Transactions.--Activity in Phase II did not seem proportionally more active than in Phase I. Phase I reported 1180 originating and 927 responding, or a total of 2107 transactions over a 6-month period. Phase II has 1594 originating and 1215 responding for a total 2809 transactions over a 9-month period (see Table 5). If anything, Phase II was less active, but then, only 10, rather than 15, libraries were involved.

The most active library overall was ERL. It accounted for 859 transactions, more than twice as many total transactions as any other individual library. It is interesting to note, however, that unlike ERL, the next three most active libraries (Agriculture, Argonne, and Oak Ridge) were far more active as respondents than as originators. In fact, Argonne and Oak Ridge initiated only about one-fifth and one-third as many transactions respectively as they responded to.

ERL originated the most transactions (728), followed by COE, Vicksburg (281), and then by Agriculture (144), COE, Fort Belvoir (136), and Lawrence Berkeley (113).

Table 5

TOTAL ORIGINATING AND RESPONDING TRANSACTIONS

Library	Originating Transactions	Responding Transactions	Total
ERL, Boulder	728	131	859
COE, Vicksburg	281	46	327
COE, Fort Belvoir	136	65	201
Argonne	60	323	383
Oak Ridge	85	255	340
Brookhaven	43	65	108
Lawrence Berkeley	113	70	183
NSF	0	13	13
Agriculture, Beltsville	144	247	391
Agriculture, D.C.	4	0	4
Total	1594	1215	2809

Argonne had the largest number of responding transactions (323) followed by Oak Ridge (255) and Agriculture (247), while ERL tallied only 131 responses.

NSF initiated no transactions and responded to only 13. The U.S.D.A. D.C. Branch Library responded to no transaction, and initiated only four. Both of these are, of course, very small libraries with very small collections, set in the heart of Washington, D.C. where resources are frequently available just across the street. More surprisingly, Brookhaven has a low rate both of originating and responding transactions. One might have expected a profile more like Oak Ridge or Argonne.

Transactions Between Participant Libraries.--It is more interesting to note the traffic patterns between the various libraries than overall traffic. Combined with a knowledge of the various libraries' strengths, specialities, and missions, such tallies can lead to hypotheses that resource sharing between certain types of libraries is of greater or lesser usefulness.

Table 6 shows that Argonne received the most overall requests (400), over half of them from ERL. Oak Ridge also was contacted a great deal (328 times); almost half of these requests came from COE, Vicksburg, and the other half from ERL. Agriculture had a wider spread; it received approximately one-third of its requests (81) from ERL, about one-quarter (66) came from COE, Vicksburg, about one-fifth (45) from Argonne, about one-eighth (29) from Oak Ridge, and a few (16 and 14 respectively) from COE, Fort Belvoir and Lawrence Berkeley.

The table shows that ERL directed most of its originating transactions to Argonne; COE, Vicksburg turned to Oak Ridge most frequently; COE, Fort Belvoir, not surprisingly, contacted COE, Vicksburg most frequently, though it contacted ERL almost as often. Argonne directed fully three-fourths of its requests to Agriculture; Oak Ridge also contacted Agriculture frequently, but,

Table 6

TALLY OF ORIGINATING TRANSACTIONS (OT) AS RECORDED BY RESPONDING LIBRARY

Originating Library

	COBBS	MSVE	DCER	IARG	TONL	NUPB	CLBL	NSF	DNAL	DNAL-DC	TOTAL
TAL OTs	728	281	136	60	85	43	113	0	144	4	1594
Libraries ntacted*											
COBBS		13	40	11	14	2	13	0	23	1	117
SVE	60		47	0	11	1	12	0	9	0	140
DCER	55	10		0	3	1	2	0	7	0	78
ARG	225	42	1		16	20	20	0	76	0	400
NL	140	132	9	1		9	24	0	13	0	328
NUPB	70	10	2	2	2		22	0	5	0	113
BL	57	3	1	1	8	10		0	5	0	85
NSF	35	5	20	0	2	0	6		5	0	73
NAL	81	66	16	45	29	0	14	0		3	254
AL-DC	5	0	0	0	0	0	0	0	1		6

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*See glossary for library symbols used for each participant.

like Lawrence Berkeley, tended to spread its requests rather more broadly and evenly. Brookhaven turned to Argonne for about half its needs, and to Lawrence Berkeley and Oak Ridge for the remaining one quarter each. Lawrence Berkeley, as said, spread its contact more evenly and broadly across the network. NSF contacted no one. Agriculture (Beltsville) sent half of its requests to Argonne, while its D.C. Branch Library recorded only four transactions, one to ERL, and three to Beltsville.

Table 7 shows that ERL responded most often to COE, Fort Belvoir, and to Agriculture; COE, Vicksburg responded to Fort Belvoir and ERL; COE, Fort Belvoir to ERL and COE, Vicksburg; Argonne to ERL; Oak Ridge to COE, Vicksburg and ERL; Brookhaven to ERL and Lawrence Berkeley; Lawrence Berkeley to ERL; Agriculture to ERL, COE, Vicksburg and Argonne; and NSF to COE, Fort Belvoir.

Table 7

TALLY OF RESPONDING TRANSACTIONS (RT) AS RECORDED BY PARTICIPATING LIBRARIES

Responding Library

	COBBS	MSVE	DCER	IARG	TONL	NUPB	CLBL	NSF	DNAL	DNAL-DC	TOTAL
OTAL RTs	131	46	65	323	255	65	70	13	247	0	1215
questing ibrary*											
BBS		16	39	165	98	31	43	1	80	0	473
SVE	15		13	34	110	10	3	0	65	0	250
ER	43	19		1	9	2	1	8	13	0	96
ARG	18	0	0		1	0	1	0	42	0	62
NL	8	4	3	15		1	8	1	29	0	69
PB	3	2	1	16	8		10	0	3	0	43
LBL	13	5	2	22	20	21		0	14	0	97
F	0	0	0	0	0	0	0		0	0	0
NAL	31	0	7	70	9	0	4	3		0	124
AL-DC	0	0	0	0	0	0	0	0	1		1

---

ee glossary for library symbols used for each participant.

Tables 8 and 9 show the means used (equipment installed or other methods) to originate and respond to requests from member libraries. By far, the greatest number of transactions were originated by means of the Rapifax (1382 out of a total of 1603). Rapifax and mail tied as favorites for responding transactions. It appears that libraries are very willing to send a one-page request via telefacsimile, and transmit a negative response, or a short response in this manner. Yet, the mail is clearly still favored for multi-page documents.

In regard to slow-scan television, only half of the participating libraries had this equipment: ERL; COE, Vicksburg; COE, Fort Belvoir; Agriculture, Beltsville; and Agriculture, D.C. Branch Library. A total of 60 SSTV transactions were recorded, as can be seen in Table 10.

Originating transactions from ERL consisted of testing the equipment in an experiment with COE, Vicksburg to see if material on the CRT screen could be successfully transmitted; and the transmission of a memo to the Agriculture D.C. Branch Library, sent by slow-scan television because that was the only Project equipment the D.C. Branch Library had.

Transactions from Agriculture, Beltsville, included seven equipment demonstrations and three equipment tests, with ERL as the contact library; one demonstration with COE, Vicksburg, as the contact; and one unsuccessful attempt to transmit a letter regarding the telephone numbers to COE, Fort Belvoir.

The four transactions from Agriculture, D.C. Branch Library were all demonstrations of the equipment, one with ERL, and three (two successful and one unsuccessful) with Agriculture, Beltsville.

Table 8

TRANSMITTAL METHOD
ORIGINATING TRANSACTIONS

TRANSMITTAL METHOD	ERL	VICKSBURG	FT. BELVOIR	ARGONNE	OAK RIDGE	BROOKHAVEN	LAWRENCE BERKELEY	NSF	USDA-BELTSVILLE	USDA-DC	TOTAL
via QWIP	42	4	10	3	5	2	0	0	35	0	101
via Rapifax	646	277	110	57	78	38	113	0	54	0	1382
via SSTV	2	0	0	0	0	0	0	0	13	4	19
via Mail	12	1	0	0	0	3	0	0	48	0	64
via Telephone	26	1	7	0	2	0	0	0	1	0	37
TOTAL											1603*

* some transactions were sent by more than one method

Table 9

TRANSMITTAL METHOD
RESPONDING TRANSACTIONS

TRANSMITTAL METHOD*	ERL	VICKSBURG	FT. BELVOIR	ARGONNE	OAK RIDGE	BROOKHAVEN	LAWRENCE BERKELEY	NSF	USDA-BELTSVILLE	USDA-DC	TOTAL
via QWIP	6	4	2	0	2	0	6	3	2	0	25
via Rapifax	87	34	33	74	89	37	37	8	94	0	493
via SSTV	13	5	21	0	0	0	0	0	3	0	142
via Mail	11	0	7	215	130	28	9	1	92	0	493
via Telephone	1	2	2	0	5	0	4	0	2	0	16
No response requested	11	1	17	14	6	0	0	0	6	0	55
Method not specified	2	0	0	20	23	0	14	1	48	0	108

* some transactions were sent by more than one method

Table 10

SSTV TRANSACTIONS

	Originating Transactions	Responding Transactions	Total Transactions
ERL	2	13	15
COE, Vicksburg	0	5	5
COE, Fort Belvoir	0	21	21
Agriculture, Beltsville	12	3	15
Agriculture, D.C. Branch	5	0	5
Total	19	42	61

Table 11

TYPE OF SSTV TRANSACTIONS

	Equipment Demonstrations	Equipment Tests	Training Sessions	Memos Letters Lists	Responses to reference questions	Not Specified
ERL	9	3	2	1	0	0
COE, Vicksburg	4	1	0	0	0	0
COE, Ft. Belvoir	17	0	0	0	1	3
USDA-Beltsville	10	3	0	2	0	0
USDA-DC	4	0	0	0	0	0
TOTAL	44	7	2	3	1	3

Four of the five libraries recorded responding transactions. COE, Fort Belvoir, was the most active, with 21 transactions. However, 14 of these were demonstrations of the equipment to high school students in Boulder, requested by ERL, three were demonstrations to other visitors requested by ERL, and one appeared to be in response to a reference question by a scientist at ERL. Of the remaining three, two were in response to requests by Agriculture and one from COE, Vicksburg. No patron names are recorded on these transactions, nor is it clear what was transmitted.

ERL recorded 13 transactions; three responses went to COE, Fort Belvoir: a work-session on how to use SSTV for teleconferencing, a demonstration of the Project's equipment, and a training session on computerized literature searching which consisted of a search done at ERL with the results and strategy transmitted to Fort Belvoir. Two were responses to the Agriculture D.C. Branch Library: an equipment test and a demonstration to show the operator there how well live pictures could be transmitted. The remaining eight responding transactions included seven demonstrations and one equipment test for Agriculture, Beltsville.

Agriculture, Beltsville, recorded three responses: one to a request from ERL for a list of demonstration participants, one to a request from ERL for a demonstration of an image of a person, and one was a demonstration for its D.C. Branch Library.

COE, Vicksburg, has five responding transactions, all to requests from ERL. These included three demonstrations of the equipment for a group from Denver University Library School, one demonstration for an ERL library staff member, and one response to an ERL equipment test to note the legibility of material on the screen.

Table 11 summarizes the types of transactions conducted by the five libraries using the SSTV equipment.

We can see that the 60 transactions consisted of 44 demonstrations, seven equipment tests, two training sessions, three transmittals of inter-library correspondence, three transactions not specified, and only one instance which may have been in response to an actual patron request.

Despite the extension of the six-month Phase II with an additional three months, only one of those 60 transactions occurred during the extension period. This was the "training session" on literature searching between COE, Fort Belvoir and ERL, set up for observation by Herner and Company during their Fort Belvoir site visit.

SECTION V

STATE-OF-THE-ART

A. Literature Review

Before we discuss the findings and implications of work done in Phase II of the Project, we would like to place the Project within the perspective of previous work in facsimile, especially that done within libraries. Although most previous studies seem to have concentrated on the use of telefacsimile (TALINET is an exception), this Project has incorporated another dimension, that of slow-scan television.

The story of telefacsimile starts with inventors in several countries, with the fruits of their labors being used by news services for commercial purposes, then by governments for military purposes.

History of Facsimile.--Facsimile transmission consists of scanning documents and converting the information scanned to electrical signals which can be transmitted over a telephone line or other communication medium in order to operate a recording device at another location so that a likeness, or facsimile, of the original is produced.

In 1842, a Scottish physicist--Alexander Bain--developed the first electrochemical recording telegraph, which worked using synchronized interconnected pendulums. In 1850, Frederick Blakewell introduced a cylinder and screw mechanism in London, which, replacing Bain's pendulums, became the standard facsimile mechanism. It remains the principle incorporated into current drum scanners, such as the QWIP used in this present Project experiment. Bain's electrochemical facsimile did cross the Atlantic to the United States but became superseded by the electromechanical printers.

In 1902, Dr. Arthur Korn, in Germany, developed a photoelectric scanning system, which led to the use of facsimile transmission of newspaper photographs by cable and radio during the early part of this century. Korn established the first facsimile network of wireless photo services in Europe, linking Paris, London, and Berlin. With the advent of World War II, the use of facsimile broadened to include the transmission of maps, weather charts, fingerprints, and photographs for military purposes. In 1922, Korn sent the first photo by radio overseas from Rome to Maine. In the United States, AT&T, RCA, and Western Union developed systems to transmit both photographs and weather information during the 20's and 30's.

Although Western Union developed a facsimile desktop transmitter for messages and put it on the market in 1948 as "Desk-Fax", until the late 1960's facsimile applications were for all intents and purposes limited to the transmission of graphical images--predominantly weather maps and news photographs--due to the expense of leasing private telephone lines. Only after the Carterfone decision in 1967, when the FCC ruled that the public telephone network had to accept the coupling of customer-owned devices to telephone company lines, did a number of manufacturers become involved in the production of inexpensive dial-up facsimile transceivers suitable for general office use.

Xerox began to market the Telecopier I and II; Graphic Sciences, Inc. brought out a line called "Dex" (Decision EXpediter); 3M marketed the VRC (Versatile Remote Copier) manufactured by Masushita of Japan. However, until recently, technical development has been slow and these machines were not convenient, fast, or flexible enough to meet the needs of modern business and industry. Also, with transmission taking up to six minutes per page, the high cost of sending the facsimile image over telephone lines was a major obstacle. Nonetheless, between 1973 and 1976 the number of facsimile machines doubled, from 50,000 to 100,000. With the present growth in information generation and dissemination, facsimile is now playing an increasing role in information transfer.

All major manufacturers now have much faster machines on the market and in the process of development. A British Library Research and Development Report presents a table of machines available in 1976 (Barrett and Farbrother, 1976). Saffady (1978) lists the equipment available in 1978. The QWIP II and the Rapifax 100, used in the Project experiment in 1979, are both two-minute machines. QWIP introduced the QWIP 2000 in 1980 (an automatic two-minute machine). Rapicom has developed new digital products: the Rapicom 1000, the Rapicom 1500, and the Rapicom 1850 all have sub-minute transmission speeds; and RCA now operates Q-Fax, a high-speed (30 second) digital facsimile service from the U.S. to Japan, other Pacific locations, Europe, and South America.

Library Applications of Facsimile Equipment.-- We have seen how the facsimile industry has moved from special applications (journalism, military purposes, weather forecasting) to business applications, resulting in compact desktop equipment. No manufacturer, however, has designed equipment specifically for library applications. When business facsimile equipment was developed in the 60's, its appearance coincided with a period of rapid growth in universities and colleges, with resultant pressure on academic libraries. Several libraries initiated experiments involving the use of facsimile equipment in the hope of improving interlibrary loan services. These experiments were largely unsuccessful due to four factors: (1) inadequacies in copy quality, (2) equipment unreliability, (3) high cost, and (4) questionable need. A synopsis of some of these experiments follows:

Kenney (1967) in an early survey, notes that the first article on fax in libraries, describing a prototype device designed for the AEC, appeared as early as 1952; that in 1954 there is mention of a Teleautograph, at the John Crerar Library; that in 1960 E.P. King conducted a very sound study on electronic transmission for interlibrary loans; and that during the same year, an experimental facsimile system was set up between the Franklin Institute in Philadelphia and General Electric at Valley Forge.

In the mid-60's MIT set up Project INTREX, a system to provide remote access to documents stored in microform. Selected microfiche would be retrieved, scanned, and transmitted to remote display terminals. The image on the face of the CRT was photographed, and an automatic processor produced good quality microfilm in hard copy, in effect, a micro-facsimile service. Users could read the film on a microfilm reader or produce prints from the microfilm. This experiment produced excellent results--but excessive computer costs. The project ended in 1972.

In 1966, Morehouse reported on a telefacsimile service between the University of Nevada at Reno, using a Xerox-Magnavox Telecopier to communicate with Las Vegas and the University of California at Davis. The experiment was unsuccessful due to frequent equipment breakdown.

In 1967, the New York State Library set up a "Pilot Project in the Facsimile Transmission of Library Materials," or FACTS. Nelson Associates, Inc., reported on the experiment in June 1968. The FACTS network included 15 libraries. The 24-hour target time for meeting requests was never reached, the average time falling between 5-6 days. Overall demand was disappointing; Nelson Associates figured that three or four times the demand was necessary to justify the expense per request. However, greater demand would have meant greater delays.

Yet 70% of users stated the material would have been equally useful if supplied two or three days later. A major complaint was poor or illegible copy. Equipment performance standards were unacceptable for library use, due to resolution problems. The experiment was considered a disappointment.

In 1968, Schieber and Shoffner reported on a one-month experiment in facsimile transmission from the Berkeley to the Davis campus of the University of California. The study was sponsored by the Council on Library Resources. They found that (a) service was slower than anticipated; the estimated service time (two-four hours) actually averaged nine and one half hours; (b) demand for interlibrary loan service was no higher during the experiment--when material could be obtained quickly--than before or after the experiment, and there was often a delay with the pick-up of requested material; (c) cost per service request was high. It was concluded that service could be improved by reorganizing the manual procedures preceding and following transmission; that demand for materials needed immediately is not high, and that a telefacsimile system should use priority scheduling to operate on a variable response basis; and that while monthly equipment costs are fixed, processing costs per request can vary. To be cost competitive with other methods, the system would have to provide one-day service. The final conclusion reached was that manual procedures needed reorganization, whether or not a telefacsimile system was introduced, and that this should occur before any investment be made.

One experiment, begun in the mid-60's, continued a long time. The Pennsylvania State University Library Network, begun in 1966, only ceased operation in May, 1975 (Lloyd, 1976). However, the same problems of uncertain copy quality, equipment maintenance difficulties, and heavy demands on staffing were reported, as we still hear today from the librarians participating in the Project which is the subject of this report.

In 1975, Hans Engelke (1976) requested state libraries to report (1) if they were part of a state-wide telefacsimile network, and/or (2) if they knew of any such network or telefacsimile use in their state. He noted that facsimile was being used in relatively few libraries, and only as an alternative to the telephone or TWX for the transmission of interlibrary loan requests; facsimile was not employed for its original intended use, the transmission of the requested materials themselves. Engelke said it is hard to make an effective assessment since so many of the experiments were informal and short-term. But the reasons he cites for the lack of success of telefacsimile operations are, once again, concerns still expressed today by the librarians in this Project (See Section IV. C).

> "Interlibrary loan traffic did not warrant such a system; the purpose of telefacsimile use was not clear; library groupings were wrong; there were misunderstandings... a problem of successfully orienting librarians to a new medium...an unwillingness to adapt to new methods and ideas." (Engelke, 1976, pages 11, 12)

Two experiments seem somewhat successful: the Michigan State Library Facsimile Communications Network, which owes its success to excellently designed request forms of time-saving multi-purpose utility, and the California State University and Colleges Facsimile Transmission Network, which follows careful guidelines and procedures (Engelke, 1978).

By 1977, Aronofsky and Korfhage, writing of library trends in telecommunications, do not even mention telefacsimile. Nonetheless, in the mid-70's, business applications of facsimile have grown considerably, and libraries have begun to reconsider the use of facsimile within their institutions. This Project, as well as the recently completed Telefax Library Information Network (TALINET) project ("Telefax Library Information Network," 1979) are examples of that revival of interest.

There has been a similar resurgence of interest in the United Kingdom. Machines are being developed; their potential for library applications is being reexamined. Digital facsimile enables information to be condensed and reduces transmission time, and thus, cost. The British Library has placed Kalle Infotech equipment at the University College, London, at the British Library Lending Division, and at the Science Reference Library to form a three-node network. The feasibility of using direct computer-to-computer links will be investigated as will the development of a system for use over EURONET and the proposed Post Office Packet Switched Service. Later, it is hoped to collaborate with research performed at Hatfield Polytechnic on remote access to microfiche stores, aiming at producing a hard copy of documents stored on fiche ("Facsimile Transmission Experiments," 1978).

There are indications of renewed interest in microfacsimile systems in the U.S. The Image Data Systems Company of PRC developed the Telefiche System, introduced at the 1978 National Micrographics Conference. While too expensive for library use today, it nonetheless alerts the profession to the possibility of similar new developments in the coming years.

The great question remains--have any solutions appeared to the four problems of quality, reliability, cost, and demand? While new equipment and new communication rates have improved cost effectiveness, problems of incompatible equipment and, more seriously, questions of user need and demand remain unanswered.

Slow-Scan Television.--The Project has investigated the use not only of telefacsimile methods, but also of the use of a related technology: slow-scan television (SSTV). A slow-scan television system operates on a principle very similar to a facsimile system. It uses a scanning process to disassemble an image, transmit it to a remote location, and then reassemble it. However, unlike telefacsimile, SSTV is not limited to hard copy documents. It can accept an electronic image from a video camera, store it for the time needed to transmit it as an electrical signal over the communications lines and, at the receiving end, reassemble the video frame and display it on a television monitor.

Comparison of various facsimile systems with SSTV systems concerns the operating features (hard copy vs. soft copy), the input and output, the resolution (facsimile has twice the resolution), the grey-scale range (hard copy is more limited in tonal range), and transmission time. However the capabilities of equipment described in the recent literature must be updated by that of currently available equipment as new models of both fax and SSTV appear on the market.

The great advantage of SSTV over standard TV is in terms of cost. Continuous video information has to be transmitted over a broadband channel. But a single video frame can be transmitted on a very narrow bandwidth of a telephone channel if a long (30-90 seconds) period of time is utilized. And a simple frame may contain all the information needed for many applications. Kenney (1967) mentions this possibility in her 1967 survey. Today, SSTV has been used successfully in two areas: education (where closed circuit television and standard television have already proved their utility) and medicine, particularly in patient care applications, where it has provided a cost effective mechanism for the transmission of information on radiographs, pathology slides, and similar fixed frame data, as well as views of patients.

William Cohen and Stuart Meyer described the educational uses of slow-scan televideo in 1975. Stuart Meyer (1977) has described a successful 4-week experiment at Northwestern University using SSTV to teach a course in Human Factors Engineering; by a professor in Evanston, Illinois, to off-campus students at Motorola's Research Center in Schaumburg, Illinois. In the area of medicine, Mitre Corporation's Telehealth Handbook (Bennett and Skinner, 1978) describes among other projects a two-year National Center for Health Services Research (NCHSR) sponsored program that uses SSTV to transmit x-ray films in Nebraska; a Navy program that used SSTV for medical consultation between ship and shore personnel; an SSTV installation linking a clinic in rural Oregon with a hospital in Eugene; and another linking a doctor's office at Block Island, Rhode Island, to a hospital in Provincetown.

Engineers and scientists working in laboratories or for corporations frequently need to make work and project-related visits to colleagues. Stuart Meyer (1977) has presented SSTV as an attractive alternative or adjunct to travel. He notes that contact between such persons is predominantly informational. While the information can be transmitted primarily by aural means (face-to-face conversations, conference presentations) there is often a significant visual component involving graphics, mathematics, and pictures. Scientists talk best with a blackboard and chalk available; engineers often present information to a group with assistance from an overhead projector. As the telephone can be used to exchange "aural" information between persons distant from each other, the visual component, which does not require motion, can be provided over a narrowband link such as a telephone line by the use of slow-scan equipment.

Meyer cites three possible promising areas of use:

> "'casual' personal interaction, usually on a one-to-one basis, extending the value of an ordinary telephone call; teleconferencing, in which several scientists/engineers/middle managers in different locations 'meet' in a seminar or conference-type interaction; trip-value enhancement, in which a personal visit to another site is 'backed-up' by teleconsultation with colleagues and support staff back at the home installation."

Meyer has written widely on SSTV applications (see Table 12) and, with David Brown (1976), has reviewed and evaluated the technology for the narrowband transmission of visual information.

A major application of SSTV involving literature, data, and specialists in the field of health sciences and medical information is currently under operation at the University of Cincinnati (U.C.) Medical Center Libraries. Nancy Lorenzi (1979) describes the Telecommunications Information Network at the University of Cincinnati as a "slow-scan with interactive audio" transmission system. It is designed to transfer on-demand medical information from the U.C. Medical Center libraries to health professionals in four hospitals. SSTV cameras are set in two locations at the Medical Center (in the Health Sciences Library and in the Drug and Poison Information Center), and video monitors are located at each of the four remote sites. Two of these sites also have the capacity to record hard copy prints of the information over same telephone lines. Any still image (a document, or microfiche, x-rays, slides, even three-dimensional models) can be reproduced via the SSTV. The slow-scan signal can even be recorded onto a regular cassette tape. This permits storage of items that are often requested, thus saving the time needed to retrieve them, adjust the camera, etc., as well as permitting the site hospitals to store any information transmitted.

The four goals of the first year were, (1) to evaluate telecommunications as a means to transfer medical information in response to questions posed by health professionals in urban and rural settings, (2) to evaluate the ability of the Medical Center to satisfy their information needs, (3) to identify the information seeking behavior, and (4) to evaluate the types of patient-care questions presented.

During the first year of operation, despite some technical difficulties which delayed installation, both quantitative and qualitative data were collected. Preliminary analysis of the data has shown that the slow-scan technology is applicable to information transfer in the health sciences, that a significant number (55.5 percent) of the responses have indeed used the SSTV, that physicians were the heaviest users of the system, and the majority of questions were related to selecting a patient-treatment approach.

Librarians at the site hospitals felt that the system has "unlimited uses" and is a "service which is vitally needed"; a complementary network of human resources was developed which established closer links between the site hospitals and the Medical Center. The use of a tape recorder with the SSTV expanded its potential to the provision of general information as well as on-demand; programs can be adapted from other formats for use specifically over SSTV.

During Year Two of the project, in addition to continuing to work on the four goals of Year One, the investigators also intend to study the feasibility of connecting the network with other SSTV networks (TALINET, Boulder, and Lister Hill, Bethesda, MD, are mentioned) and whether the network is cost effective and can become self supporting. It is hoped that the outcomes of the study can be generalized to health care systems throughout the country. Project results will be disseminated widely. The Telecommunications Information Network is considered an innovative model of an on-demand medical information transfer system whose potential could have national implications.

SSTV technology is also being used to reach a remote rural region and link it to an on-going broadband two-way television system already successfully in operation. The Central Maine Interactive Telecommunications System

(ITS) funded by the Veterans Administration, links seven locations in the state of Maine (Cowan, 1977a). The system focuses on education and on meeting the needs of the total health care community. Unlike the Cincinnati project described above where information flows one-way from the area medical center to the isolated remote sites, the two-way system of ITS permits a decentralized approach. No major medical center is involved and the participants are of relatively equal size and capabilities, and having identical consoles, any one location can originate as well as receive programs. Robert Cowan, the Director, presents a picture of a new cooperative telecommunications model where each member has control over who sees and hears its transmissions, and each is involved in the entire educational process (Cowan, 1977b).

The slow-scan interface will utilize current "off the shelf" hardware (Cowan, 1979a). The essential ingredient for success will reside in the creative selection of the most important video image to transmit, while maintaining an interactive audio link. The slow-scan link will give those in the rural area access to programs on the Central Maine network, the ability to conference and share among themselves, as well as contribute to central Maine programs, and thereby reduce their sense of professional isolation (Cowan, 1979b).

In a test of four slow-scan TV systems for remote teaching, Peters (1979) found that faculty members indicated that they accepted the concept of SSTV, yet all but one had no immediate application to their respective areas. Thus, Peters felt that SSTV was not accepted in fact. In his study suggestions were made for the development of a hybrid SSTV system which did appear to meet the needs of remote teaching.

Peters believes that SSTV will continue to expand until the time that fiber optics replace copper telephone lines in homes and businesses. At that time, he says, full motion, two-way television will be economically feasible and will become the more desirable medium.

Table 12

GENERAL USES OF SSTV

Educational Uses

Professional education (industry, cooperative education teacher training, law and medicine update, etc.)

Adult education (continuing education, evening school, culture, current affairs, etc.)

Inter-campus link (university-university, university-schools, university-labs, lab-lab, med school-hospital, etc.)

Social service (infirmary and handicapped students, crippled, deaf, ghetto enrichment, correctional institutions, homes for the aged, etc.)

Functional Uses

Substitute for travel (save time, energy resources, and dollars)

Enhance interaction (technical, administrative, student-teacher, rapid translation and interpretation, etc.)

Security (site surveillance, fire watch)

Medical Uses

Education (hospital-med school, seminars and lectures, continuing professional updating, training of auxiliary personnel, etc.)

Emergency (supervision of paramedics, medical and dental auxiliaries)

Outpatient care (monitor outpatients, nursing surveillance, morale of bedridden, deaf children)

Consultation (remote physician-specialist, etc.)

Community health (sharing of facilities in group practice, health maintenance organization, etc.)

Administrative (hospital billing, etc.)

Research (animal surveillance, continuing experiments, field research)

From: William C. Cohen and Stuart L. Meyer. Development of the Educational Uses of Slow-Scan Televideo, Bioscience Communication 1: 169-183, 1975.

B. Discussions with Members of the Oversight Committee and Other Experts

To determine current thinking about the use of telefacsimile and slow-scan television in libraries, we called 13 people knowledgeable in the state of the art. Five people had conducted studies on or had worked with telefacsimile in library settings (Engelke, Fordyce, Kenney, Shoffner, and Walker). Of those, four are members of the Oversight Committee.

Because the literature contained far more references to articles on telefacsimile than on SSTV and because we had talked with the five people cited above, we tried to balance the information gathered on the topic of telefacsimile with information from people expert in the use of slow-scan TV, preferably in libraries. After several attempts, we located and talked with eight experts: a man who has been called the "father of slow-scan"; scientists and engineers; librarians; and communications specialists who have used--or are using--slow-scan television in projects nationally and in other countries; and two manufacturers of slow-scan equipment. The names of people interviewed appear below.

Oversight Committee Members

Oliver Cairns	MIDLNET, Washington University St. Louis, MO
Robert Cowan	Kansas City Research Medical Center Kansas City, MO
Hans Engelke	Waldo Library, Western Michigan University Kalamazoo, MI
Samuel Fordyce	NASA Washington, D.C.
Brigitte Kenney	Infocon, Inc. Golden, CO
Ralph Shoffner	Ringgold Management Systems Beaverton, OR

Other Experts

Bert Cowlan	Consultant New York, NY
Robert Fine	Fine Communications, Inc. New York, NY
Andrew Horowitz	Telecommunications Cooperative Network, New York, NY
Stuart Meyer	Northwestern University Evanston, IL
David Smith, Director of Marketing	Robot Research, Inc. San Diego, CA
Glen Southworth, Sales Manager	Colorado Video, Inc. Boulder, CO
William Walker, Director	Medical Center Library of New York New York, NY

Telefacsimile.--Of those people who had written earlier reports, we asked, "What do you consider the most significant advance in the field since your report?" Their answers concerning the quality of the equipment and its product varied; one said that fax systems need to speed up to accommodate the load and need to produce a clearer image; the machines now on the market do not show promise of being manufactured at a cost that a library can afford. While some are faster, the increased speed decreases the clarity of the print. Another committee member said, however, that the speed has increased, that there is better resolution of the copy, and that machines have been developed that scan only the print part of the page, not the total page. One development in the technology is the FAXON Model 811 book copier which will have an exhibit at the forthcoming American Library Association annual meeting late this June and early July. A FAXON representative will show a video tape of the operation and display sample transmissions. The implication here is that fax will become routine as libraries increase their use of the new telefacsimile equipment.

In general, the comments regarding the telefacsimile equipment concern the still-present need to speed transmission to accommodate the increasing loads of material to be sent. "If time can be reduced to 15 seconds per page," Hans Engelke remarked, "then we can move a lot of volume." Oliver Cairns commented that the equipment used in the Project does not demonstrate the real state of the art. Kenney mentioned that one of the difficulties with telefacsimile has been the lack of a book copier, and that resolution has not been adequate for footnotes, unless the fine detail setting is used. With the forthcoming demonstration of a book copier, perhaps a breakthrough has been achieved in this area. Engelke also mentioned that perhaps we should look at different new technologies--for example, the use of satellite for transmission--rather than improve facsimile devices.

For some time the National Library of Medicine (NLM) has conducted a project with the British Lending Library Division using a satellite in the communication of information. The first domestic project of this nature is a six-month experiment with the Medical Library Center of New York (MLCNY). The Medical Library Center comprises 59 institutional members of which 16 are participating in this project. The project is in the second of two three-month phases. In the first phase, NLM absorbed the total cost. In this second phase, users are being charged 50 cents per page. The equipment used is Rapicom 100 which transmits at three speeds and has a multipage feeder. In the first three months of the experiment, the MLCNY processed 500 requests. Some libraries stated that there was an urgency to fill some requests but others said that delivery one week later was satisfactory. NLM has assigned one person to handle the project at NLM. If MLCNY sends a request during the day, it will have a reply by telefax that same day. An example of the procedure: a library requests an article from MLCNY. If MLCNY does not have the article, they request a copy from NLM which, if it can locate the material, returns a copy the same day

By a daily delivery service, MLCNY sends the telefaxed copy to the requesting library. During Phase II, the volume has appeared to have diminished, possibly because of the charge.

In considering pros and cons of telefacsimile in libraries, several positive points have emerged. Engelke stated that fax is feasible in smaller libraries or where there is a lighter load, that fax can expedite flow, and that the present technology really is good enough. Ralph Shoffner remarked that telefacsimile is useful for small volumes of material needed in a hurry, thus placing the telefacsimile in a category of use for a special situation, rather than as a routine measure for handling all interlibrary loan requests.

Some negative points were also made. Shoffner remarked that some machines are not compatible with others. We also heard this comment during our visit at Lawrence Berkeley Laboratory.

Samuel Fordyce stated that they do a lot of work at NASA with facsimile. They use high speed circuits and have a 6-seconds/page facsimile machine (Nippon Electric) that they use for document exchange between NASA and its contractors. However, the current technology costs exceed library budgets. Fordyce said that it is unrealistic for libraries to use it; although the costs may indeed go down in the future, they still may not be low enough for libraries.

Slow-Scan Television.--Many of the discussions centered on slow-scan television, perhaps because this is a relatively new technology as applied to libraries. Shoffner commented on its usefulness for teleconferencing, for example, for use by people physically removed from each other who are working on the same project. He considers this coupling a semi-library use.

He explained: if he and a colleague were working on a design issue and were using material from the home office but adding to it from a remote site, they could use SSTV and a blackboard, make modifications to a design, and communicate these far better with slow-scan than with fax. SSTV in this area--which he termed "creation" as opposed to "retrieval"--offers a great deal of promise, but it is not a direct library use. On the other hand, he finds SSTV extremely expensive to staff in order to use the equipment flexibly for such activities as scanning abstracts. He sees no good solution to the staffing problem.

Kenney does not see SSTV being useful in the sense of a competing technology, and she does not find its use promising for libraries.

Robert Cowan, who has worked with broadband television and has been experimenting with slow-scan television, stated that there is a misconception by people associated with the Project of what can be accomplished with slow-scan television, and particularly a misconception of what he has accomplished with the medium. He thinks that there are a number of areas in the library where teleconferencing can be useful; much of his work in Maine with seven small hospitals located in rather remote areas has been to link them via televised conferences for resource sharing of expertise and for training. He recommended that slow-scan TV should be used for multiple purposes so that the cost-benefit ratio is good.

Many of Cowan's comments concern the human factors involved in the use of the technology and most of those centered on the use of SSTV. The first problem, he noted, is that the user sophistication was not high. He thinks one should try teaching audio conferencing techniques first, then expand to video. It is important to get people involved, to look at interpersonal relationships and to see how to facilitate those relationships.

Cowan believes that utilization of SSTV should be expanded to include other areas of library service. Both telebrowsing and reference activities leave the equipment idle too long, and this gap in use results in an increase of "skill decay". "You lack the skill so you use the equipment less, so you further lose the skill," he explained. He referred to an example in telemedicine in Alaska: the original concept was to use telemedicine for emergencies. The problem was, the technology wasn't used enough, thus people were insecure about how to use it and in turn, didn't use it enough. "High priority events are erratic; they are 'random access' events." After they began to use telemedicine in ongoing procedures--not just for emergencies--Cowan said he began to see the expanding use of the equipment.

In Maine each "demonstration" encounter had an actual use. Cowan stressed that actual use causes people to be serious about the event and takes their minds off the equipment itself. His point is that unless there is a real task to be addressed, there is not enough payoff for the participant to use the equipment.

He advised that people should look at other ways to incorporate the technology into the daily work pattern of the library staff so that librarians would increase their use of the technology. He felt that the librarians participating in the Project may have been reluctant to involve other individuals in the use of SSTV and that they were not its strongest advocates because they themselves were not comfortable with the equipment. He suggested that areas be found where the librarian would serve as the interface between patrons so that the librarian would feel stronger about the role of technology in the library environment.

He thinks that libraries must become more aggressive in their approach to servicing researchers. He explained: "libraries deal with print. At the present, it takes a year from the time research is done to when it is published in a journal. Even in NTIS, it takes four to five months for a report to become available. This is too long a turnaround time," he feels. "Now that librarians use data bases, they can perform a search which finds material that has been published up to the last six months. But what about the past six months?" he asked. He believes that librarians should move to deal with "resource individuals." If a scientist wants information more current than the search has provided, he should move to a resource individual. "Librarians," Cowan feels, "should bring people to people, not just people to print."

He suggested some additional uses of SSTV: researcher-to-research librarian contacts. For example: the ERL library has some special collections and some research librarians who know a particular area well and know how to elicit information in that area. By using a directory of resource people, a researcher could contact that librarian directly without first contacting his own library. The research librarian could incorporate SSTV technology when she assists that researcher.

He also suggested setting up monthly continuing education sessions on data bases to teach librarians, for example, the different command structures and tree branchings inherent in the different data bases.

He offered still another suggestion: at present, librarians put the client in touch with material. What about librarian to librarian contacts? He said that there are 40 free electronic bulletin boards throughout the country where librarians could leave messages for each other: "will you do a search for me," "does anyone want..."

Cowan has some real reservations about telebrowsing because it is so personnel-intensive. For example, a journal article often doesn't fit a TV screen and so the journal has to be moved around for good viewing. The uncontrolled size of journal abstracts makes them difficult to transmit via SSTV. He thinks that fax is a more appropriate technology to use for reading abstracts.

He repeated what he had said earlier at a meeting in Boulder, that we need to take a broader look at the utilization of the hardware. Librarians should be able to see how the equipment can be used after the experiment. The use of the equipment needs social reinforcement for continued use.

He feels that librarians will now have second thoughts about SSTV because their experience in this Project was not as positive as it could have been.

Both Cowan's statements and beliefs were confirmed by Bert Cowlan who has been working for some time with slow-scan television in a number of settings. Cowlan does communications consulting and is a policy planner and management consultant who bridges hardware and software in communications. Currently he is engaged in studies for an FM UN radio station, preparing a report on the use of videodisc for a Wall Street firm, and involved in another project using a small satellite earth station. He said that he and Bob Fine, the "father of slow-scan television," have been working together on some projects. He explained that Fine's technology goes back to the late 1960's, that the equipment shows an image in black and white, that audio travels with the video, that the equipment is transportable and smaller than a backpack, and that it can use an acoustic coupler. He indicated that Fine's devices are not in production but had been used in a variety of settings, including Australia's Outback.

At the beginning of the interview, Cowlan stated that SSTV should never be used to handle alphanumerics--that's a bad application of the technology. He cited as one example a project for the Educational Testing Service (ETS) in

Princeton in which he and Fine collaborated. They planned to send test questions to programs in other places but found this use of SSTV is a waste of bandwidth and telephone. He said there is a better way to send alphanumeric information than by SSTV and that he and Bob Fine are working on that approach.

Cowlan sees SSTV used as a training device and he cited several examples. One is for training automobile mechanics; here an audiocassette is used as a storage medium, and an oscilloscope screen is used for display; the set will show someone, for example, how to disassemble a motor. He and Fine have produced material on this topic in Spanish and English. He added that as cars increasingly acquire microprocessors for diagnostic purposes, that slow-scan has a place in that arena for teaching people how to handle repairs. He also gave several other examples of how SSTV is being used at present; for example, he said you can hook one into a police car radio, can get a "mug" shot, and can send that photo immediately to police headquarters where it can be compared with photos in the file of mug shots to see if the photographed individual is "wanted."

Cowlan explained that you can take slow-scan information, send it to a computer, and the computer can then display the information on a CRT. The computer can transmit the CRT display to terminals in classrooms or use two interactive systems with, for example, a TRS 80. Cowlan indicated that slow-scan can be used in the medical area to transmit x-rays or images of patients for diagnosis or for consultation with experts at other areas. However, "the real question," he emphasized, "is, where do consulting physicians not have to see the image?"

He described some other current uses of slow-scan television: in New York, the United Press International (UPI) is sending photographs of news via slow-scan TV. He said that this is a new use of Fine's slow-scan equipment which apparently is smaller and portable. Any newsperson needs only a phone to send a photo on fast-breaking stories to the newsroom.

In a conversation with Robert Fine whom several people called "the" expert in the field, Fine stated that there are a number of applications that have not been brought to fruition. He cited two examples: news reporting and corporate communications; he added that an enormous potential exists for developing a mix of slow-scan television, phone, and telefacsimile, and that the telephone company has recently become very interested in pursuing this mixture.

Glen Southworth, the sales manager of Colorado Video, Inc., the manufacturer of the slow-scan equipment used in this study, sees the major applications in such areas as teleconferencing for business and government for people to communicate both audibly and with pictures, for remote diagnostics, for instruction and education, for broadcasting, for security applications, and for monitoring remote sites. Some of these uses imply that the equipment is not labor intensive and that it is not as difficult to use as it was in the Project settings.

David Smith, Director of Marketing for Robot Research, Inc., also cited some of the same uses of slow-scan television. He added others: signature verification and sending raw data, as in telemetry. He said that SSTV had been used in the Three Mile Island incident shortly after the problem occurred. "Slow-scan TV transported minds between Harrisburg and Lynchburg."

Human Engineering.--The human engineering aspects of the Project seemed be be one of the overriding problems in the conduct of the Project. Several people addressed this issue. Cairns said that the problem is people: getting people to use the equipment. There is no urgency on most interlibrary loan material, he added. (The data obtained from the transaction forms seems to bear this out.) Andrew Horowitz agreed; he said that people do not want to get involved with technology, that it takes some time to change people's habits. In a sense, this same comment was made by Dr. Farley, i.e., that people do not like to change their habits. Cowan noted that the Project personnel were interested in modifications and refinements he had made to equipment in Maine. Cowan said that Robot Research has just gone into production with a SSTV teleconferencing unit called the "MCD Model" based on his design.

Effect of Electronic Publishing on Demand for Telefacsimile.--We asked the members of the Oversight Committee whether they thought electronic publishing and electronic mail would affect telefacsimile. Comments from several members follow: Shoffner feels these new techniques will have an immense effect in the long run but he raised several questions: Where will all the machine-readable information be maintained? How will switching be provided? How will the electronic books and journals be indexed? There is a driving force for remote access, but we do not know whether this will create an extra demand for remote access by telefacsimile or for slow-scan television.

Kenney feels that electronic publishing and electronic mail will have a positive influence on libraries, will help the standing problem of document delivery. "As electronic publishing increases, as material is available in machine-readable form, and if storage devices get lower in price, libraries will find all this a positive influence."

Fordyce said once all the information is programmed and put into machine-readable form, then it is simple to ship it back and forth. But someone has to pay for all the programming to put it into machine-readable form. Someone has to pay for storage. "It's a clear case of champagne appetite and a beer budget."

General Comments.--Engelke pointed out one characteristic of libraries as compared with industry that does affect the consideration of telefacsimile. "Industry can perhaps use telefacsimile more effectively because usually there is a main office and several branches, whereas a library serves people in all directions."

Fordyce commented that libraries have too low a budget to use expensive technologies, and that slow-scan TV is not applicable to libraries because it costs too much.

Meyer raised an important question: to what extent do people need hard copy and to what extent do they need to screen hard copy? The answer to this question goes back to basic user studies which underlie the use of these technologies. Meyer pointed out that online data bases provide stimulation without gratification.

Engelke suggested that there are several factors to consider in such a study: the adaptability of people, the workload, and the transmission costs.

We asked each member of the Oversight Committee to comment on the study as a whole and indicate what they would have liked to see. Engelke said he would have liked to have seen the Project carried on for a longer period; the time was too short and yet the new technology has to appear permanent or else people won't adapt to it. "This has happened over and over again in the past. Experiments are too short. They don't get a fair chance." He felt that a five-year test period, announced at the start, would give a project some degree of permanence, and allow it to be absorbed into the system.

Shoffner advised that there should have been more preparation and grounding such as determining where the users were at the start of the study. He, too, commented that you don't change people's habits easily.

Cairns said that the value of this experiment lay in trying to see how well it could be used for interlibrary loan, for exchange of technical information, for other purposes, and that if libraries got used to using these techniques, that they then could evolve to more advanced technologies. He thinks that the Project was not a fair experiment, that it did not provide extensive use of the equipment, and that more controlled experiments are needed. If more users had been interviewed by the library staffs, he thinks more patrons would have been brought in. Yet we know that Boulder and other libraries did interview the patrons but it did not seem to make a difference. Cairns also felt that wider enthusiasm was needed among participating libraries. User interest should have been determined first, he felt, before the library agreed to participate. Although in Boulder there seemed to be user interest, there was no follow through by patrons.

Kenney considers it a drawback that the Project was set up with limited funds and with limited objectives. She feels that slow-scan television could have been "pushed more" in the beginning.

Fordyce commented that the equipment was utilized too little and it was too expensive.

Many of these points will be addressed in Section VI.

SECTION VI

DISCUSSION OF RESULTS

This evaluation has looked at the Project from a number of perspectives: the nature of the libraries and the data obtained from analyses of the transaction forms, impact on libraries, impact on patron users, network considerations, potential of new telecommunications equipment relevant to libraries, and potential of changes in library activities that will have an effect on decisions regarding the use of telecommunications equipment and its original objectives. Each of these areas will be discussed in some detail from the standpoint of the data obtained during the study and from the narrative information obtained through discussions with library staff, patrons, and experts.

A. Libraries in the Project; Data Obtained from Analyses

The 10 libraries varied in size of collections from over one million holdings to about 25,000. Professional staff size ranged from two to 194. Most libraries were situated in areas where university, medical, or other federal libraries are located which enrich the library environment and make a large variety of materials available for local resource sharing.

The collections of the Project libraries include approximately 52 subject areas. Some of these areas showed commonalities. For example, five libraries listed environmental studies as subjects of concentration in their holdings; four libraries noted mathematics, physics, biological sciences, and energy as collections within their scope. Three libraries listed nuclear science and medicine; and two, geological sciences, hydraulics, chemistry, and materials science. For most of the topics, only one library had a significant collection in a particular area (e.g., oceanography, astronomy, soil mechanism, concrete, shore protection, computer sciences, electronics). It should be noted that these descriptions of the collections were gathered from both the library's own listing as well as listings in directories; also, some libraries provided scope in more detail than others. For example, one library might specify biology while another might provide a breakdown within biology such as entomology. The point is, however, that although there were some areas in common, there were also a number of dissimilarities. Both aspects are useful for resource sharing and networking. Thus, the Project networking was not necessarily forced except where the usual local interlibrary loan resources were circumvented for purposes of this Project.

Types of Transactions.--The 1594 originating transactions included interlibrary loan (75 percent of the activity of the Project), correspondence (approximately 15 percent), schedules, lists, etc. (about 4 percent), demonstrations (about 3 percent), reference handling (about 1.5 percent) and literature searches (less than 0.5 percent). Clearly, interlibrary loan was far and away the bulk of the activity in this area. The transmittal methods used were QWIP (about 6 percent), Rapifax (about 86 percent), mail (about 4 percent), telephone (about 2 percent), and SSTV (about 1 percent).

Of the originating transactions, Boulder originated 470 interlibrary loan requests (about 29 percent) and Vicksburg 278 (about 17 percent). Of those who were contacted most often, Argonne received about 25 percent and Oak Ridge about 20 percent. Boulder is a large library in the midst of good resources but Vicksburg is a small library in a rather isolated setting. One might think that Vicksburg's requests were necessary and natural while Boulder made a point of using the network as fully as possible in order to give full test to the Project.

Argonne and Oak Ridge were the most contacted, perhaps because of the subject area of work and partly because of the fact that these libraries had the equipment for transmission all of the time and would respond. In contrast, Agriculture--where the interlibrary loan activity is heavy--had said that the Project was considered a burden. For Ft. Belvoir, a small library, the Project was considered useful and helpful.

The types of responses indicate what the users requested in terms of type of materials. Again, the requests come as no surprise when one is acquainted with the needs of scientists: journal articles accounted for 655 (about 54 percent) of the requests.

Telefacsimile appears more useful in industry than in libraries, as Engelke pointed out in Section V.B. NSF has used telefacsimile frequently to communicate with scientists and administrators, yet used it much less in the library for the Project.

B. Impact on Libraries

Types of Difficulties Imposed.--The test of the feasibility and acceptance of the equipment was somewhat skewed since the Project increased the work of the libraries and our interviews with library personnel indicate that it was regarded unfavorably from that point of view. Burdens were placed on staff in the sense that normal interlibrary loan procedures were not followed. There was not always enough staff in the libraries to cope with the additional amount of processing required: maintaining the transaction records accurately, filling out the originating and reply forms in detail did not always occur. This made it harder to evaluate the quantitative data.

The malfunctioning of equipment, and the time required by the equipment for transmission also affected the Project. Examples here are the troublesome paper feed during QWIP transmission (a two-to-three minute waste of time because there was no way to abort the transmission process), faulty feeding on the Rapifax, and time required to set up the slow-scan television equipment for use. Operators also had to check the machines frequently to see if the phone was ringing or if material had been transmitted and was lying in the machine.

Since participants had agreed not to impose controls, the libraries did not follow the same ground rules concerning when to use telefacsimile and when to follow their usual interlibrary loan procedures. This also affected the comparability of the results of the Project in different libraries.

In this Project, the procedures and equipment were labor intensive. If, however, effective and efficient equipment had been available that could sit on a key operator's desk or beside the desk, and if prior photocopy was not a requirement of the equipment, then the work load probably could have been cut in half and transactions might have been more frequently and more accurately recorded. If protocols (i.e., procedures to ensure participation at a comparable rate and in a comparable manner) had been agreed upon by participants and data collected regularly, more quantifiable results would have been available.

When IS Copy Needed?--But work load is only a part of the problem. A more basic issue concerns a question that Professor Meyer raised: "Under what conditions do people need to see the hard copy and under what conditions do they need to have it in hand?" Perhaps a good many copies that were made would not have been really required if the patrons could have inspected the material prior to transmission, if the user could have quickly browsed one or two pages and determined that the article was not what he wanted--or was satisfied with the information he saw. What this means is that some capability for viewing a document first is sensible and useful.

If libraries truly become communication centers as some have foreseen, then the use of slow-scan television is applicable and not to be discounted because of its apparently inefficient use in handling alphanumeric information. For one thing, SSTV can be used to show the results of a database search on another CRT and a user could know immediately whether the search should be restructured to give him the information he desires.

Shoffner asked, where will all the machine-readable information be maintained? It could be stored in audio or videocassettes or on videodiscs, then called up for display in SSTV as requested. An article by Robert Smith in a 1978 issue of The Futurist included a section on slow-scan video:

> "TV will also assist interlibrary loans. By the 1990s, video transmission of loaned materials will, in fact, be the norm...
>
> "Slow-scan television transmits, via telephone lines, one picture element every 60 seconds...A receiver at one library collects images sent from another and displays them on a regular TV screen or stores them electronically on videotape or audiocassette for later display.
>
> "The exciting future prospects of this invention include a tremendous storage potential (up to 50,000 documents per videotape) and the convenience to the library user of being able to 'browse' through the documents at another library and receive the source material almost immediately upon request."

Libraries now have books and journals on microform, and the information can be retrieved and displayed on a screen. In a sense, this is a precedent for use of material stored on videotape and called up for viewing on slow-scan television.

Shoffner asked, too, how switching will be provided. Switching could be eliminated if libraries subscribed to videodiscs and audiocassettes--or, central libraries in a network could house these materials and transmit them on request through slow-scan television.

Shoffner also raised the question of how this material will be indexed, i.e., the time and money needed to convert retrospective collections into searchable form.

The majority of library staff felt that the Project experience improved service to patrons and contributed to their own personal development. In general, however, Project participation did not affect their acquisitions decisions.

C. Impact on Patron Users

How did the users feel about the documents they received? Did they think the documents were relevant, arrived on time, were helpful? The data show that they did find the information helpful approximately 72 percent of the time. Mostly they wanted journal articles (70 percent). The material was on time 60 percent of the time.

The real question is, how to balance these figures against the costs and inconvenience to the library. Is it worth it for proposal writing, for the need to know, for writing papers? It would be interesting to investigate the trade-offs but that is not the subject of this report. What the patrons did say was that "faster is better."

D. Network Considerations

Networks seem to be successful when people are truly interested in participating and making them work. A comment that appeared frequently in discussion with librarians participating in the Project was the large amount of interest of the participants and their comments that they got to know what other libraries had and the people at those libraries. To make a project like this work effectively, an online union catalog would have been a big help. The more each library knows about others in the network, the better. While each library filled out a questionnaire which was distributed to all participants, an in-depth profile of each library would also have been additionally useful in determining which library to approach.

Library staff interviewed felt that the Project did increase contact with other libraries; about 40 percent felt they would continue interlibrary loan transactions with these libraries, and 2:1 felt that it enhanced network development.

In the April 23, 1979 New Yorker, an article in the "Talk of the Town" (p. 35) noted in regard to the accident at Three Mile Island nuclear power plant,

> "At Harrisburg, it may have been the technician who, on being asked whether a worker might not be able to fix a stuck valve inside the radioactive plant replied, In theory he can, but in practice, he can't."

The same words might have been spoken of the equipment in this Project: in theory it should have been splendid, in practice it is not. Why? What can be done in the future? Is it indeed worth doing? Under what circumstances?

One procedure that might have helped is a set of protocols for the use of telefacsimile. Most of the libraries, especially the ones located near universities or other large libraries, went out of their way to participate in the Project. Switching centers might be used--for example, to determine if a local library has the requested information; if not, to consult an automated system (such as the OCLC subsystem offers) to see who does have the material and then request that library to send it either for viewing by slow-scan or hard copy via facsimile. This procedure might work best in a network with special libraries that could form a consortium based on similar core and dissimilar peripheral interests.

The introduction and management of a project such as this one requires planning, meetings, trials, and then careful monitoring. People skills are a necessary part of any such enterprise. Despite memos and suggestions from Boulder, participants' actions show that suggestions were not always followed up.

Section VII

IMPLICATIONS, CONCLUSIONS, AND RECOMMENDATIONS

A. Implications

Needs of the Field.-- In the past two decades, libraries have experienced significant changes. Automated systems--only a dream on the horizon in the beginning of the 60's--are now a reality. The use of the rapidly increasing number of data bases has become an accepted daily activity in many libraries. Many libraries are looking at automated systems to compensate for limited budgets, to facilitate resource sharing, to help cope with the growth of the literature, and to offset the effects of the increasing use of data bases which increase the requests for articles resulting from those searches. As Stuart Meyer pointed out, the data bases stimulate but they do not satisfy the appetite. Something else has to satisfy in terms of providing the ability to view hard copy or produce a copy of the document in hand.

This Project explored both: it offered a way for the user to view a document or to obtain a hard copy. But both methods involved technology that the libraries found awkward to use and which imposed additional difficulties on already strained situations. While one purpose of the study was to conduct a fair test of the technology, in a sense, the test was not fair for several reasons which include the short duration of the Project, the installation problems of the equipment, and the lack of imposed protocols with set procedures to follow (e.g., when to use normal interlibrary loan routes and when to follow the Project).

What was learned from this study? At the present state of the art of the technology and its applications this study has not shown that the equipment was regarded favorably for regular daily use by either the staff or the patrons in these libraries. While the majority of patrons were not aware that telefacsimile or other equipment was used, they were nonetheless generally satisfied with the service they received thereby. However, with improvements in design and operation and with more creative applications, especially for slow-scan TV, we believe that the technology could find a useful place in the library, especially as data bases continue to make impacts on libraries through increased number of patron requests. Also, new and different technology such as videocassettes and videodisc--or a mixture of those, telefacsimile, and SSTV might be called for.

An experiment such as this Project can be viewed as a reminder of several important points at a time when new technologies are being applied to libraries. First, the fact that the role of libraries is changing. Second, that human engineering factors must be considered in the introduction and in the testing of any technology. What will its introduction do to the present system? Will it increase staff work? How and at what level? What can be redesigned to eliminate that increase? If new technology is introduced, it should be used often and for real-time projects. SSTV did not really get a fair chance because it was not used on a daily basis to satisfy real needs. Third, that in testing equipment, record keeping should be simplified, either by automation, reduction, or elimination, to ensure participation. Fourth, that established protocols must be followed to ensure that test results are comparable. Fifth, that the characteristics of participating libraries should be well known as well as the details of their holdings. Sixth, that federal libraries should work toward the appropriate meshing of all the new technologies: OCLC-type systems, online catalogs, fast transmission of needed material, and a management system that constantly monitors a project so that the information can be--and is--used for continual improvement of that system.

Experiential Data on SSTV vs. Reports and Suggestions in the Literature.--SSTV is at the same time both the most controversial part of this Project and the one that seems to offer the most potential for development and use for information provision. If the latter, then the SSTV equipment must be modified to be smaller, lighter, portable, available at lower cost, and easier to use with receivers installed in laboratory or office settings as well as in libraries. If one thinks of SSTV as a kind of enhanced microfilm reader, then it is easy to think of calling up information from a store of articles on videocassettes to view the information. If the viewing equipment is located in the laboratory, the scientist can then view what he needs at his convenience any hour of the day or night.

SSTV can also be looked upon as an intelligent terminal. Like word processing equipment, it can be used for local purposes part of the time and as a communications device for a variety of purposes at other times.

In addition, slow-scan television can be used for many other purposes and used frequently throughout the day--but again, in laboratories and with an audio component. The equipment can be used for viewing diagrams, for checking equipment malfunction, for reading unpublished data, for inspecting the results of searches on CRTs, for teaching search strategy to end users of data bases, for communication within learning resource centers. This is not to diminish the importance of the library, but rather to anticipate that the library is entering another phase in its ever-changing role of coupling user to information and user to user. In this new role, the librarian assumes a more important responsibility--for instance, for knowing sources of information (data bases, etc.), for knowing resource personnel, and for entering original data into national systems.

Conclusions and Recommendations

The Project was designed to deal with some operating problems common to a group of federal libraries: access to desired publications, rising costs of documents, proliferating data bases, staff and space shortages, travel and budget curtailments, and increasing interlibrary loan activity with concomitant slow and unpredictable yet costly mail service. The objective was to develop improved methods to share library resources.

In several ways the Project met that objective. Resources were shared; analysis of the data obtained during the Project shows that 75 percent of the Project's activity was involved with interlibrary loan with 70 percent of those requests for journal articles. Although infrequently used for the purpose, the SSTV equipment available for preliminary decision-making *did enable* a requestor to screen the requested information to determine if it was indeed desired. The Project *did allow* the transmission of the requested article quickly by the use of telefacsimile. Staffs interviewed felt that the Project *did increase* contact with other libraries. Forty percent of those librarians felt that they *would continue* ILL with those libraries after the Project ended. Staff training opportunities *were improved* in the sense that librarians considered the Project worthwhile with regard to personal development.

Analysis of the Project also brought out information about some less desirable aspects. The participating librarians felt that the Project *increased* the work load. Telefacsimile, while useful, *creates a labor intensive situation* in libraries because, in addition to the photocopying that is normally done in interlibrary loan procedures, the QWIP required person-to-fax-to-person involvement; sending multiple copies by Rapifax required hand feeding. In addition, some of the equipment was considered rather cumbersome to use. With newly developing telefacsimile equipment that does not require prior photocopying, the process could be simplified for the sender.

SSTV is also being improved and, according to the optimism expressed by some of the people interviewed in the conduct of the evaluation, the technology does have a place in the communication of images, although how and when libraries should use it seemed rather vague. While a use for this form of communication may exist, other technology such as two-way television may in time be economically feasible and might become the more desirable medium for such communication.

To place the evaluation of this study in a realistic pespective, we feel that the conclusions drawn from the evaluation should include a consideration of the direction in which libraries--and the entire field of print communication--are developing. In the past decade technology has made a stunning impact on libraries. The use of computers, telecommunications, data bases, and microforms has led to the growth of information utilities and the development of networks; they have resulted in new sharing of resources, new attitudes on the part of librarians, and new expectations by users. One particular impact on library services has been the integration of document delivery services with data base search results. As new sophisticated information services come into being, the library will probably function increasingly as a resource management center that serves its users rapidly and comprehensively, even though the collection of that particular library is limited. The worlds of print and electronic media are merging. Experts have predicted that in about 20 years telefacsimile will eventually be by-passed by the distribution of electronic "soft copy" and that, consequently, facsimile transmission has no long-term future. An Arthur D. Little report on A Comparative Evaluation of Alternate

Systems for the Provision of Effective Access to Periodical Literature (1979) stated: "The one electronic information delivery option available to NPC [National Periodicals Center], facsimile, will probably remain expensive, labor-intensive and not in major use."

In the meantime, libraries do have needs and do wish to improve the sharing of resources. Telefacsimile as well as SSTV do have roles to play in helping libraries share those resources.

The libraries of the future will be tied by telecommunications into a national network. How the network evolves depends upon many factors, among them the conduct of research studies and projects such as this one, the development and testing of models, the exploration and testing of applications of the new technology. In the meantime, telefacsimile and slow-scan television are here and working. Although they pose drawbacks, these devices do have a use in this decade and the next. For those reasons, we recommend that federal libraries be encouraged to continue to study new ways to deliver copies of documents and to experiment with their use in network-type situations.

We also recommend that the Federal Library Committee consider support of a future project based on the submission of a plan for a model program to be conducted in a controlled situation that runs parallel with routine library activities and where data are collected concurrently. Suggestions for this study result from the analysis of activities within this Project. Such a study should include written protocols for the simultaneous conduct of the experimental and routine operations; for a union catalog of participating libraries; for basic handling of criteria which participating libraries agree to meet; for well-designed and accurate records of staff time and costs for each operation by each method, records of the delivery of each document to each requesting library, time of delivery or pickup by the patron, a record of users' evaluation of the effect of delivery time on their project, and an estimate of the dollar value of faster-than-mail, same-as-mail, slower-than-mail delivery to the user; and for the regular and frequent examination of records to make certain that protocols are being followed and criteria met.

REFERENCES

Aronofsky, J.S., and Korfhage, R.R. "Telecommunications in Library Networks: a Five Year Projection." *Journal of Library Automation*, *10*: 5-27, 1977.

Barrett, R., and Farbrother, B.J. *FAX - A Study of Principles, Practice and Prospects for Facsimile Transmission in the U.K.*, The British Library Research and Development Reports, Report No. 5257 HC. Boston Spa, England, British Library Lending Division, 1976.

Bennett, A.M., Rappaport, W.H., and Skinner, F.L. *Telehealth Handbook: a Guide to Communications Technology for Rural Health Care*. Prepared by the METREK Division of MITRE Corporation, DHEW Publication No. (PHS)79-3210. Hyattsville, MD, National Center for Health Services Research, May 1978.

"Facsimile Transmission Experiments." *British Library Research & Development Newsletter*, *15*: 3-4, Sept. 1978.

Cohen, William C., and Meyer, Stuart L. "Development of the Education Uses of Slow-Scan Televideo." *Biosciences Communications*, *1*: 169-183, 1975.

Cowan, Robert A. "Planning and Implementing Maine's Interactive Telecommunications System: Development of Cooperative Medical Education in a Rural Setting." Presented at the First National Conference on Health to Underserved Rural Areas Through Community Health Centers, Boston, MA, Dec. 1, 1977a.

Cowan, Robert A. "Medical Education in Central Maine via Interactive Television: A Design." *The Journal*, *3*(6): 13-17, 1977b.

Cowan, Robert A. "The Diffusion of Innovation and Self-Management of Telecommunications." Symposium presented at Electro '79, New York, April 1979.

Cowan, Robert A. "Interinstitutional Cooperation and Telecommunications." Paper presented at the Annual Meeting of the Health Sciences Communications Association, Kansas City, MO, Aug. 1979.

Engelke, Hans. *A Survey on Telefacsimile Use in Libraries in the United States*, RLMS Microfile Series, Vol. 2. Chicago, American Library Association, May 1976.

Engelke, Hans. "Telefacsimile Use in U.S. Libraries." *Interlending Review*, *6*(2): 44-49, 1978.

Kenney, Brigitte L. "Survey of Interlibrary Communications Systems," R.M. 369. Boston, EDUCOM, April 1967.

Lloyd, H. Rollin. "The Pennsylvania State University Libraries Network." In: Hans Engelke. *A Survey on Telefacsimile Use in Libraries in the United States*...Chicago, American Library Association, May 1976. Appendix A3.

Lorenzi, Nancy. *Telecommunications Information Network: A Model for On-Demand Transfer of Medical Information*. Cincinnati, University of Cincinnati Medical Center, Nov. 1979.

Meyer, Stuart L. "Controlled-Scan Televideo: Utilizing Communications Channels Efficiently for Teleconferencing and Information Transfer." *NTC*, *45*: 3-1--3-10, 1977.

Meyer, Stuart L. "Telecommunications and the Expansion of Information Services." Paper presented at the Conference on Telecommunications Technologies, Networking and Libraries, June 3, 1977 at the National Bureau of Standards, Gaithersburg, MD.

Meyer, Stuart L., and Brown, David. "A Review of Available Technology for Narrow-Band Transmission of Visual Material." *Biosciences Communications*, *2*:38-48, 1976.

Morehouse, Harold G. *Telefacsimile Services between Libraries with the Xerox Magnavox Telecopier*. Study prepared for Council on Library Resources, Inc. Reno, University of Nevada Library, Dec. 20, 1966.

Nelson Associates, Inc. *The New York State Library's Pilot Program in the Facsimile Transmission of Library Materials: A Summary Report*. New York, 1968.

Peters, Donald Creswell, Jr. *A Test of Four Slow-Scan Television Systems for Remote Teaching*. Pullman, WA, Information Futures, 1979.

Saffady, William. "Facsimile Transmission for Libraries." *Library Technology Reports*, *14*(5): 455-531, Sept./Oct. 1978.

Schieber, William D., and Shoffner, Ralph M. *Telefacsimile in Libraries: A Report of an Experiment in Facsimile Transmission and an Analysis of Implications for Interlibrary Loan Systems*. Los Angeles, University of of California, Institute of Library Research, Feb. 1968.

Telefax Library Information Network: TALINET II Continuation Grant. Denver, Graduate School of Librarianship and Information Management, 1979.

APPENDIX A

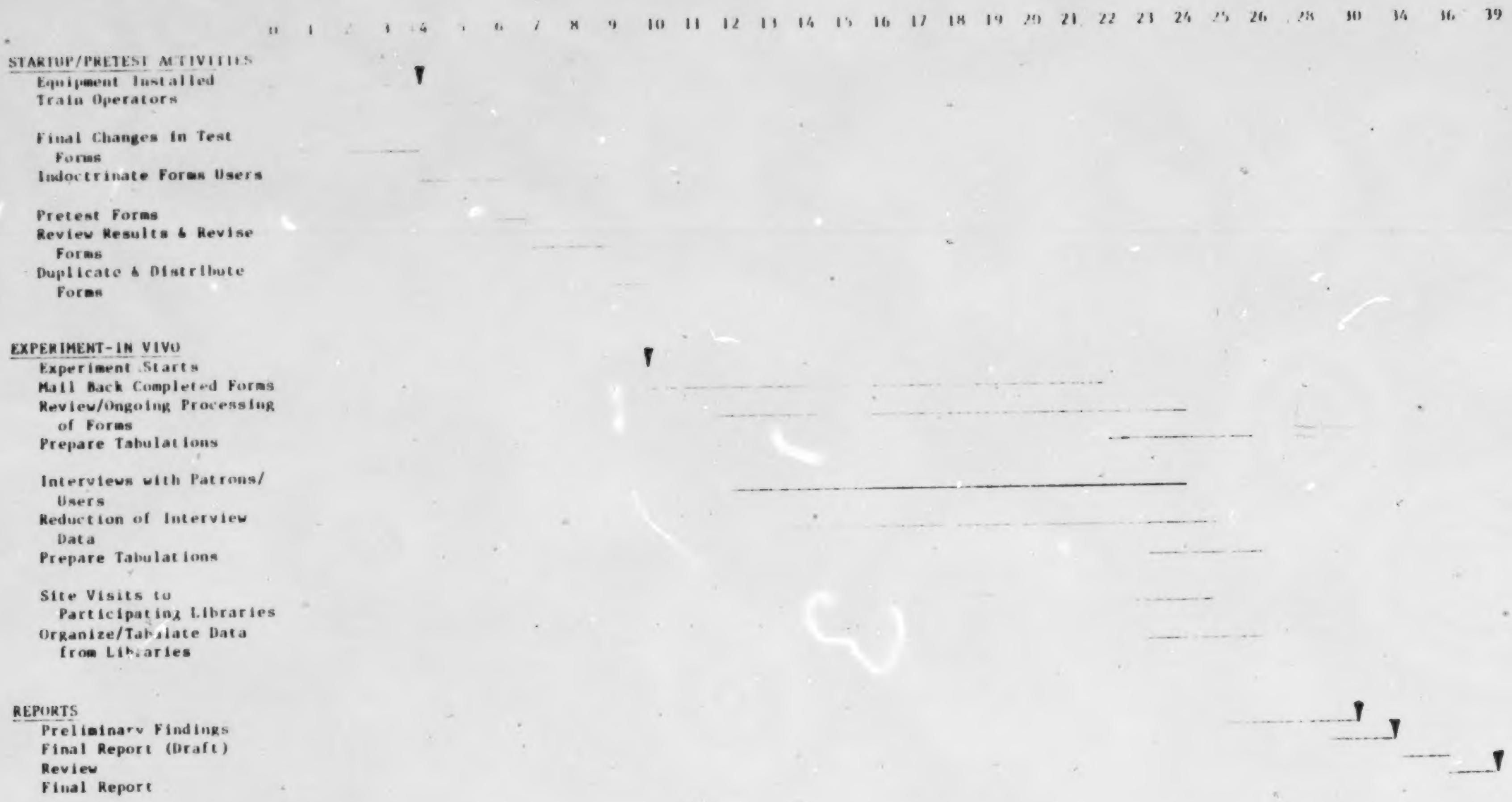
PROJECT PLAN AND SCHEDULE

The pilot project plan has been divided into three major task areas or phases. Phase I covers all startup and pretesting activities. Phase II encompasses the actual pilot experimentation with the equipment, the data collection, and the data reduction and tabulation. Phase III includes the preparation of reports on the findings and conclusions of the experiment. This phasing is reflected on the chart in Figure 1, which depicts an overall time frame of 39 calendar weeks for the pilot experiment and shows the several tasks to be carried out during each of the three phases.

Phase I--Startup/Pretest Activities

As will be noted in Figure 1, Phase I will cover an approximate two-month period (9 or 10 calendar weeks). During this period, installation of equipment is to be completed and the operators trained in its use. While this is in progress, final changes are to be made in the draft (test) forms that will be used for data collection during the experiment, and appropriate individuals at each site are to be indoctrinated in the use of the forms. At this point, the data collection forms are to be pretested during a brief period of actual use by the participating libraries and then revised, based on the results of the pretest. Thereafter, the data collection forms are to be duplicated in the requisite number of copies and distributed to the participating libraries--the concluding step in Phase I.

FIGURE 1. PROJECT SCHEDULE



Phase II--Conduct of the Experiment

The actual experiment, as shown in Figure 1, is to take place during an approximate 16 calendar week period. From the experiment start date, the participating libraries are to use the data collection forms in all of their requests and transactions with other participating libraries for a period of 12 calendar weeks; they are to send the forms completed each week to a specified address, where ongoing review and data reduction activities will take place and the results will be tabulated for subsequent analysis.

Telephone interviews with a representative sample of patrons served during the experimental period will begin about two weeks after the experiment start date; the information gained via these interviews will be extracted from the interview guides or protocols on an ongoing basis, so that the tabulation of these data can be completed and be ready for analysis by the end of the 16-week period allocated for Phase II.

Site visits to the participating libraries, to collect additional data needed for evaluation and interpretation of the results of the experiment, can begin as soon as the 12-week data collection period is over. The site visits are scheduled to be carried out during a three week period, which will allow time enough for the information to be assembled and organized for use in Phase III.

Phase III--Project Reports

This third phase of the pilot project is allocated about three calendar months, but it can begin before the actual conclusion of Phase II, so that preliminary findings can be reported within a month after the end of Phase II. The final report, containing the full pilot experiment results, the conclusions, and recommendations, is scheduled to be prepared in draft form, for review and subsequent emendation based on the results of this review, prior to its final submission at the end of the nine-month (39 calendar week) project schedule.

APPENDIX B

Revised:
May 3, 1978

ON-SITE INTERVIEW WITH LIBRARY PERSONNEL

1. Library ____________________

2. For Director Only: How are your interlibrary loan services staffed?

Position Title	Grade Level or Hourly Wage
____________________	____________
____________________	____________
____________________	____________
____________________	____________

3. Position Title of Interviewee ____________________

   ________ GS Level or Hourly Rate ________ _____ Full Time _____ Part Time

4. Name of Interviewer ____________________

5. Date ____________ Time of Day ____________ Time Zone ________

6. Which equipment have you personally operated?

   a. _____ Slow-scan TV
   b. _____ Rapid Telefax
   c. _____ Conventional Telefax

7. How often do you use the equipment?

	11 or more times per day	2-5 times per day	1-5 times per week	1-5 times per month
a. Slow-scan TV	________	________	________	________
b. Rapid Telefax	________	________	________	________
c. Conventional Telefax	________	________	________	________

8. Are you considered the key operator? ____________________

9. Do you train other staff members on the equipment? ____________________

10. Which equipment do you prefer to use and why?

    Slow-scan TV ____________________

    Rapid Telefax ____________________

    Conventional Telefax ____________________

Revised:
May 3, 1978

ON-SITE INTERVIEW WITH LIBRARY PERSONNEL

11. What times of the day seem more efficient to use the equipment?

a.m. 3 4 5 6 7 8 9 10 11 p.m. 12 1 2 3 4 5 6 7 8 9 10

a. Slow-scan TV ____________________

b. Rapid Telefax ____________________

c. Conventional Telefax ____________________

12. What times seemed least efficient? ____________________

13. Have you used the automatic features of the rapid telefax? __________

14. What improvements in design would you recommend for:

a. Slow-scan TV ____________________

b. Rapid Telefax ____________________

c. Conventional Telefax ____________________

15. Do you feel that your contact with other libraries has:

a. Increased ____________________

b. Decreased ____________________

c. Remained the same ____________________

16. If increased, do you believe that this has resulted in better service to your clientele? ____________________

17. If decreased, why? ____________________

____

____

18. Do you expect to continue interlibrary loan transactions with the participating libraries at a level equal to or greater than during the project?

______ Yes ______ No _____ Don't know

If "No", why? ____________________

19. What uses besides document delivery did your library make of:

a. Slow-scan TV	b. Rapid Telefax	c. Conventional Telefax
_____ Teleconferencing	_____	_____
_____ Training	_____	_____
_____ On-Line Literature Searching	_____	_____
_____ Original Translating	_____	_____
_____ Other (Specify)__________	_____(Specify)__________	_____ (Specify)__________
__________	__________	__________

20. If funds were no object, would you recommend that the library retain

a. Slow-scan TV ______________________________

b. Rapid Telefax ______________________________

c. Conventional Telefax ______________________________

21. (For Directors Only)

Do you plan to budget for

a. Slow-scan TV ______________________________

b. Rapid Telefax ______________________________

c. Conventional Telefax ______________________________

d. Other Narrow-band Equipment (Specify) ______________________________

in order to retain the equipment after the project has been concluded?

Please give the reasons behind your decision.

____

____

____

____

____

22. Have you shared the equipment with other elements in your agency?

_____ Yes _____ No

If "Yes", cite examples.

a. ____________________

b. ____________________

c. ____________________

d. ____________________

23. Have you extended service to researchers not sponsored by any of the agencies supporting the participant libraries? _____ Yes _____ No

If "Yes", cite examples.

a. ____________________

b. ____________________

c. ____________________

24. Do you believe the project experience has been worthwhile with regard to:

a. Service improvement in your library? ____________________

b. Personal development? ____________________

c. Network development for future local benefit? ____________________

d. Cooperative use within your own agency location? ____________________

e. Service to non-Federally sponsored researchers? ____________________

25. Has your participation in the network affected the acquisitions decisions you have made? ____________________

26. What areas of staff expertise in other network libraries were used during the project not available to you locally? ____________________

____

27. Has your justification in the network affected your staffing decisions?

____

28. Do you have other comments to make? ____________________

____

____

APPENDIX C

Federal Library Network Plan
Slow Scan Television Contract #512
Library Patron Interview
April 15, 1980

My name is ______________________________ and I'm with Herner and Company in Arlington, Virginia. I'm calling on behalf of a group of ten libraries which are participating in a nationwide pilot experiment (for the Federal Library Committee) involving the use of slow-scan television and telefacsimile equipment. Through the use of this equipment, the libraries hope to improve their services to users like yourself. I'd like to take a few minutes of your time and ask you a few questions that will help in the evaluation of the experimental findings. Your responses will be held in strict confidence. They will be used in preparing tabular data, but they will never be attributed to you personally.

1. According to the records of the ____,
(name of library)

on ______________, you asked the library to ______________________________
(date of service) (describe the service)

____

Is this correct?

☐ Yes (skip to question 3)

☐ No (skip to question 2)

☐ Don't Know (skip to question 3) ______________________________________

____

2. If "No," what did you ask the library to do for you? ____________________

____

3. For what particular purpose did you need this information? (Prompt: That is, did you need it in connection with research you were planning? in connection with a project you were working on? in connection with a report you were

writing? or some such purpose?) (verbatim response) ______________________

____

____

4. Did you find that the information you received was, in fact relevant to your request (verbatim response) ______________________

____

____

____

5. With regard to the timeliness of the service, did you receive the information or materials you requested (read first three)

☐ On time, as you requested (skip to question 7)

☐ Earlier than you requested (skip to question 7)

☐ Later than you requested (skip to question 6)

☐ Don't remember (skip to question 9)

6. If later than requested: did the lateness ofthe response have any kind of adverse effect on your work?

☐ Yes (skip to question 9)

☐ No (skip to question 9)

7. If respondent answered "on time" or "earlier than requested" to Question 4: was the promptness of the response beneficial to you in any way?

☐ Yes ☐ No (skip to question 9)

8. If "Yes," how, specifically, did receiving this response benefit you? (verbatim response) ______________________

____

____

9. Were you aware at the time you made the request that the service would involve

☐ use of slow-scan television equipment?

☐ use of telefacsimile equipment?

☐ Yes (skip to question 11)

☐ No (skip to question 10)

Remarks (record verbatim) ______________________________

____

____

10. Did you subsequently become aware that the service was provided through the use of this equipment?

☐ Yes ☐ No

11. On any previous occasion, have you had experience or have you been provided service through the use of telefacsimile?

☐ Yes ☐ No ☐ Don't know

(If "Yes," prompt) What was the nature of this experience or service?

(verbatim response) ______________________________

____

____

12. On any previous occasion have you had experience with or have you been provided service through the use of slow-scan television?

☐ Yes ☐ No ☐ Don't know

(If "Yes," prompt) What was the nature of this experience or service?

(verbatim response) ______________________________

____

13. Finally, there are four questions I would like to ask that concern you personally and your job. You may prefer not to answer them; but if you do, your responses will help us to interpret our data and I wish to emphasize that your responses will never, in any way, be connected with your name. (If interviewee elects not to respond, so note, and skip to the end of the interview protocol.)

First, what is the highest degree that you hold?

☐ high school graduate (skip to question 15)

☐ bachelor's degree

☐ master's degree

☐ doctoral degree

☐ other ____

14. In what field is this (highest) degree? _________________________

15. What is your official job title? ______________________________

16. In your day-to-day work, what exactly is your major occupation or primary job activity? (verbatim response) __________________________

____

____

Read to all Interviewees

This is the end of the interview. Thank you for your cooperation. We appreciate your taking the time to answer these questions.

APPENDIX D

TABLE 9-3

UNIT COSTS FOR TELEFAX DOCUMENT DELIVERY

MONTHLY COST FORMULAE

Qwip 4-minute Mode	Qwip 6-minute Mode	Rapifax (High Speed)	Rapifax (Standard Speed)	Rapifax (Fine Detail)
\$240+\$16.06x	\$240+\$22.14x	\$1680+\$2.13x	\$1680+\$3.40x	\$1680+\$4.25x

(Fixed costs include five sites plus resource mode at \$40 for Qwip and \$280 for Rapifax. Unit costs for a 6-page transaction are determined on the basis of the highest line charges between any two sites in a 6-site system. x = number of transactions.)

AVERAGE MONTHLY COSTS
(Actual TALINET Average)

At 137 transactions per month:

	Site Average Costs	(Unit Costs per 6 page Transaction)
Qwip 4-minute mode	$\frac{\$2361+\$240}{5} = \$488$/month	$\frac{\$2601}{147} = \$17.69$
Qwip 6-minute mode	$\frac{\$3255+\$240}{5} = \$623$/month	$\frac{\$3495}{147} = \$23.78$
Rapifax (High Speed)	$\frac{\$1680+\$313}{5} = \$403$/month	$\frac{\$1993}{147} = \$13.56$
Rapifax (Standard Speed)	$\frac{\$1680+\$500}{5} = \$445$/month	$\frac{\$2180}{147} = \$14.83$
Rapifax (Fine Detail)	$\frac{\$1680+\$625}{5} = \$457$/month	$\frac{\$2305}{147} = \$15.68$

APPENDIX E

EVALUATION OF THE USE OF SLOW-SCAN TELEVISION AND TELEFACSIMILE: RESPONSES TO COMMENTS BY MEMBERS OF THE OVERSIGHT COMMITTEE

Note: The page numbers given in this section refer to pages in the draft copy which J. Riley sent to members of the Oversight Committee for their comments. Because Herner and Company replied to those comments and questions, we have kept those page numbers for correlation with the original correspondence. However, because of subsequent adjustments in the text to reflect certain comments, the page numbers in the final version may differ.

RESPONSES TO OLIVER CAIRN'S COMMENTS

1) Final Report adjusted.

2) The NSF project summary referred to here is entitled: "Evaluation of the Use of Slow-Scan Television and Telefacsimile in a Library Network." We felt that it was appropriate to the evaluation of the use of equipment in an experimental situation to consider the objectives of the experiment, as they were presented in Dr. Maier's proposal. The objectives have now been removed from the report.

RESPONSES TO ROBERT COWAN'S COMMENTS

1) p. 105:
Final Report adjusted.

2) p. 107:
Final Report adjusted.

3) p. 110:
Final Report adjusted.

RESPONSES TO HANS ENGELKE'S COMMENTS

1) p. 92:
   Final Report adjusted.

2) p. 111:
   Final Report adjusted.

3) p. 128:
   Final Report adjusted.

RESPONSES TO BRIGITTE KENNEY'S COMMENTS

1) The Evaluation Report was based on Phase II only.

2) We did take the "labor-intensive" aspects of the test into account. In fact Dr. Maier, in her comments, objected to that subject very strongly. However, in addition to the necessity of recording information the equipment itself is labor-intensive and is responsible for most of the complaints by Project participants: the Rapifax and QWIP for requiring hand-feeding of each page, and the SSTV for requiring operators on both ends of a transaction.

3) p. 45:
We did not censor verbatim comments. The comment stands.

4) p. 37:
Final Report adjusted for clarity.

5) p. 38:
For special needs, i.e., if information was needed in a hurry, the staff were willing to feed pages one by one into the Rapifax machine. However, this was a time-consuming process which they preferred not to have to do on a regular basis.

6) p. 39:
Final Report adjusted.

7) p. 40:
Final Report adjusted.

8) p. 42:
Final Report adjusted.

9) p. 43:
Final Report adjusted.

10) p. 46:
See response to comment 3. Also, the Minutes of the Oversight Committee Meeting at Herner and Company on February 29, 1980 state:

> "This project does not evaluate slow-scan and fax PER SE but only in the context of the FLNPP" (i.e., within the context of this experiment, and not in a real world situation).

11) pp. 54-60:
We felt that a single table was too confusing. Yes, the descriptions of the libraries could have been put into an appendix; we placed them in the text in order to present a setting for the interview comments.

12) p. 61:
There was not a great deal to correlate. We did try several combinations without any significant results.

13) p. 63 (2nd para.):
Final Report adjusted.

14) p. 67:
See response to Comment 11.

15) p. 68:
The questions came from the interview form designed for the Project.

16) pp. 114-117:
Final Report adjusted.

17) p. 119:
Final Report adjusted.

18) p. 119C (2nd para.):
Minutes of the Oversight Committee on February 29, 1980 at Herner and Company state:

> "No cost figures will be contained in the report."

19) p. 121 (Objectives):
We worked with the information available. We were unable to obtain comparable baseline information.

20) p. 125:
Final Report adjusted.

21) p. 126:
Final Report adjusted.

22) p. 128:
Final Report adjusted.

RESPONSES TO JOAN MAIER'S COMMENTS

Note: All page numbers refer to the draft circulated to the Oversight Committee members.

1) p. 1 (2nd para.):
Incorporation of Oversight Committee members' comments into the report was performed in accordance with Herner and Company's letter to Jim Riley of November 26, 1979, point 4, and in accordance with the outline of the report, submitted by Herner and Company and approved at the February 29, 1980 Oversight Committee meeting.

2) p. 1 (1st and 2nd para.):
Final Report adjusted.

3) p. 1 (5th para.):
We cannot delete this sentence. It accurately represents the opinions of the participant library staff involved.

4) p. 2 (1st para.):
Final Report adjusted.

5) p. 2 (3rd para.):
Dr. Maier's comment is correct. The participants agreed not to impose controlled conditions. However our recommendation stands: that a future evaluation of SSTV and telefacsimile equipment in a federal library network will yield clearer results if the experiment evaluated is conducted under controlled conditions.

6) p. 4:
Final Report adjusted.

7) p. 6:
See p. 16, reference to TALINET Project.

8) p. 7 (2nd para.):
This paragraph summarizes MetroStudy's report pp. 47-53, "Conclusions and Recommendations." These pages contain no mention of whose function it is to collect and review and monitor the transaction forms.

9) p. 11 (1st para.):
Dr. Maier's comment is correct. The forms were revised and the participants accepted the redesign. We merely state here that the forms were still not fully nor uniformly completed by the participants.

10) p. 11 (2nd para.):
Dr. Maier's comment is correct. However, we are not stating why the forms were not collected; we are stating why it is impossible to quantitatively evaluate the use of equipment without having comparable quantitative data.

11) p. 12 (1st para.):
Final Report adjusted.

12) p. 16 (1st para., 1st sentence):
Final Report adjusted.

13) p. 16 (3rd para.):
TALINET's Continuation Report is referred to regarding costs on the following page.

14) p. 20 ([4th para.] sic; 6th para.):
Dr. Maier's comment is correct. However, we are here merely describing the environmental conditions of the experiment, rather than presenting the reasons for how these environmental conditions were arrived at.

15) p. 22 (1st para., 1st sentence):
Final Report adjusted.

16) p. 22 (1st para., last sentence):
Final Report adjusted.

17) p. 25 (1st sentence):
Final Report adjusted.

18) p. 25 (3rd and 5th paras.):
Our report merely states what the Directors of NSF and NAL told us, it does not criticize individuals.

19) p. 31 (1st para., 1st sentence):
We are not suggesting that the paper work was "overwhelming." We are reporting a consensus of opinions derived from the statements of staff members in participating libraries.

20) p. 32:
The library staff differed in the length of their comments. We include more material for some libraries and less for others because we obtained more comments in some libraries than in others. However, since this is no longer a DRAFT REPORT, but a Final Evaluation Report, available to the public, we have revised this section in order to remove the names of individuals from their comments in order to maintain confidentiality.

21) p. 35:
We can only repeat that Vicksburg informed us that they had made a big push to publicize SSTV at the beginning of the Project and that their patrons were not interested. As far as gathering this information from patron interviews is concerned, the transaction forms show no cases of patron use of SSTV (other than demonstrations, etc.) during Phase II of the Project in any of the participating libraries. (See Table 11.)

22) p. 36 (1st para.):
This was not precisely a "training experience" for the librarian. She received the display on SSTV of the printed search strategy (which could actually have been equally well relayed by Rapifax) and this assisted her in rethinking her search strategy. It was thus of help to her and she was pleased with the result of the interaction.

23) p. 37:
Final Report adjusted.

24) p. 38 (2nd para., last sentence):
Final Report adjusted.

25) p. 40 (1st para.):
This is a report of a comment from Brookhaven. It may or may not be correct in fact. But the suggestion was made and is reported as such.

26) p. 42 (2nd para.):
OCLC is mentioned here because the ORNL staff felt that it was a new method which, like this Project, was directed at significantly decreasing response time in interlibrary loan transactions, and ORNL staff preferred the ease of using OCLC to using this Project.

27) p. 43 (2nd para.):
Final Report adjusted.

28) p. 48 (entire page):
This section reports on comments from the USDA D.C. Branch Library. We interviewed persons at the D.C. Branch Library at the specific request of Dr. Maier (see Herner and Company letter to Jim Riley of January 3, 1980 referring to Dr. Maier's letter of December 5, 1979.) John Welsh is included in the section on the library at Boulder. Sandra Young's comments are not included because she was no longer employed at Fort Belvoir and thus unavailable.

29) p. 48 (2nd para.):
Final Report adjusted.

30) p. 48 (3rd para.):
Final Report adjusted.

31) p. 51 (last para.):
This paragraph reports on NSF. It does not criticize individuals.

32) p. 51 (last para.):
Final Report adjusted.

33) p. 52 (last para.):
Final Report adjusted.

34) pp. 52-53:
Dr. Maier's comment is correct. In fact, this paragraph states that only three libraries had SSTV.

35) p. 61 (1st para.):
Final Report adjusted.

36) p. 62 (1st para.):
Dr. Maier's comment, while correct, does not appear to relate to p. 62, first paragraph. This paragraph is about responses to Q. 16 on the questionnaire, not about changes in administration.

37) p. 62 (1st para., last sentence):
It was stated that the five persons come from libraries that differed widely in size.

38) p. 62 (2nd para., last sentence):
Final Report adjusted.

39) p. 64:
We began our interviews using the patron interview forms which were part of the original experimental design submitted to NSF. After initial interviews were conducted, it became clear that certain changes would improve the performance of the instrument. We accordingly added a few words to clarify certain questions, and deleted the section concerning the patrons' evaluation of the SSTV image, since there were no patrons in the sample of 82 who had received information via an SSTV transaction. It is common and accepted practice to refine a questionnaire or survey instrument in the light of what occurs in the initial interviews. This eliminates awkwardness or ambiguity in phrasing and assists in eliciting required information in the most direct manner. Both interview protocols are now presented in the Final Evaluation Report as Appendix C.

40) p. 73 (last para.):
Final Report adjusted.

41) p. 76 (last para., 1st sentence):
Final Report adjusted.

42) p. 81 (3rd para.):
Although we have a record for COBBS-200 and COBBS-201 originating transactions (yellow forms) we have no record of a reponding transaction (blue forms) from MSVE. In tallying transactions, Herner and Company matched each yellow originating transaction with its blue responding transaction. We then noted for each pair whether or not the patron received his request, and it was from these that we selected our candidate patrons for interviews. Since COBBS-200 and 201 had no matching responding transaction, they were not selected.

Regarding Dr. Maier's comment that we should have interviewed patrons involved in demonstrations of the equipment, we note that the Minutes of the Oversight Committee Meeting of February 29, 1980, at Herner and Company state: "This Project does not evaluate slow scan and fax PER SE but only in the context of FLNPP." We therefore only interviewed patrons who had received results through the network, not those who had reactions to demonstrations of the equipment's speed of transmission, resolution of images, etc.

43) p. 100-112:
Final Report adjusted.

Note: Discussions with Oversight Committee members were held for two reasons: 1) Letter of November 26 from S. Herner to J. Riley stated that such discussions would be held; and 2) many of the members of the Committee are librarians and experts on the subject of facsimile since they had conducted similar studies and written reports.

The choice of experts was based on the people located who had had experience with library fax or SSTV projects. One of those experts directs the Medical Center Library of New York and has been conducting a telefacsimile project with NLM. Because four others (members of the Oversight Committee) had conducted studies on or had worked with telefacsimile in library settings, we tried to balance that composition with people expert in the use of slow-scan TV in library or information sharing experiences. In spite of much effort, we found few experts in the use of slow-scan TV in such experiences.

44) p. 101 (last para.):
Final Report adjusted.

45) p. 102 (1st para., 4th sentence):
Final Report adjusted.

46) p. 105 (2nd para., 1st sentence):
Final Report adjusted.

47) p. 112 (2nd para., 1st sentence):
Final Report adjusted.

48) p. 114 (3rd para., last sentence):
Final Report adjusted.

49) p. 115 (3rd para., 1st sentence):
Final Report adjusted.

50) p. 115 (4th para., 1st sentence):
Final Report adjusted.

51) p. 116 (2nd para.):
Final Report adjusted.

52) p. 116 (3rd para.):
Final Report adjusted.

53) p. 116 (last para.):
Final Report adjusted.

54) p. 117 (2nd para.):
Final Report adjusted.

55) p. 119 (last para., last sentence):
Final Report adjusted.

56) p. 120 (last para.):
Final Report adjusted.

57) p. 123 #5:
Copyright information was not recorded consistently.

58) p. 124 (last para., 1st sentence):
Final Report adjusted.

59) p. 123 #7:
Herner and Company interpreted "training" to mean, for example, training in how to access on-line data bases, training in OCLC input, introduction to AACR 2 with cataloging examples on-screen, and continuing education for professionals or technicians, not training in how to operate the SSTV or telefacsimile equipment.

60) p. 123 #10:
Final Report adjusted.

61) p. 124 #11:
We do not agree. Phase I had already provided a clear and current knowledge of procedural problems and of equipment limitations.

62) p. 125 (2nd para.):
We did not say that the installation problems were related to the administration of the Project. We merely state here that the test was not fair due to several reasons, one of which was installation problems.

63) p. 126 (2nd para., 7th sentence):
We did not say that equipment currently available should not be used. We recommend that it be used for real-time projects and on a daily basis.

64) pp. 127-128:
Final Report adjusted.

65) pp. 131-134:
Final Report adjusted.

RESPONSES TO RALPH SHOFFNER'S COMMENTS

1) p. 26:
Final Report adjusted.

2) p. 115:
Final Report adjusted.

3) pp. 121-122, E1, 2, 3:
Unfortunately, baseline quantitative information on ILL transactions prior to the Project was not available in a comparable manner from all participating libraries.

4) p. 125:
Protocols had indeed been worked out for the Project but it was agreed that these were not to be imposed on the participants. Participants chose whether or not to follow them--to the detriment of th study.

5) p. 125 (3rd para.):
The second sentence has been reworded. Cost analysis would indeed have been helpful but it was agreed at the February 29 Oversight Committee meeting that no cost figures will be contained in the report (see minutes of the meeting).

6) pp. 127-128:
Final Report adjusted.

OBJECTIVES OF THE PROJECT

Consider the objectives of the project in light of the data nad interviews.

1. To improve the relevance and timeliness of document delivery.

   No baseline information is available for this study on relevance and timeliness of document delivery during regular interlibrary loan activities. Therefore, this objective cannot be addressed. In reviewing comments of users, it appears that most of the information was relevant and most appeared timely--but users may feel that way about normal interlibrary loan service.

2. To improve access to other libraries, mitigating the handicap of distance specifically for resource sharing.

   Again, no baseline data is available showing normal interlibrary loan access. How much more might have been obtained through the Project than through normal channels cannot be ascertained except indirectly through interview results.

   Twenty-two of the 38 replying librarians felt that contact with other libraries has increased as a result of the project and 17 of 22 replying felt that this has resulted in better service. Fifteen of 38 replying expect to continue interlibrary loan transactions with the participating libraries at a level equal to or greater than during the Project while 10 did not expect to continue, and 10 didn't know. Of the ones who said "No," four will return to regular channels, and three cited lack of equipment as the reason. Only one gave as the reason that the Project placed too great a load on some participants; only one said that the project created false patterns. In the sense of improving access, this Project can be said to have achieved Objective 2.

3. To lower operating costs or at least offset inflation by shared use of the librarys' collections and better use of the talents of local staff, especially through shared use of subject, language, and data processing expertise.

Because this study did not concentrate on costs, it is difficult to evaluate the first part of this objective. To do so, one would need to balance the cost of the increased amount of staff time involved in conducting telefacsimile transmission, for example, against the purchases saved by each library.

4. To practice more effective use of the postal system and other transportation-oriented delivery systems such as local courier, Federal Express, etc.

Again, it is difficult to evaluate the value of the Project in regard this objective because no baseline data exists as part of the study.

5. To develop procedures for creative compliance with the 1976 copyright law without sacrifice of service to the research community.

Information is not available.

6. To coordinate library services more closely with data center services.

Again, the information was not supplied for the evaluators to be able to state whether this situation did, in fact, occur.

7. To improve staff training opportunities, especially with regard to online retrieval systems.

The study did show that the project was considered worthwhile with regard to personal development. Twenty-nine of 38 replying said "yes." Though training experiments were not conducted, the potential through the use of SSTV was there.

8. To improve local inventory control (file integrity).

No data were gathered to show how this objective could be met.

9. To be able to respond rapidly to changes in agency mission.

Although the potential certainly exists for rapid response within hours, the data collected show that very little use was made of this potential. According to the interviews, only one library director plans to budget for equipment on the basis that it speeds communication and only one that it was used to rush correspondence.

10. To extend full service to the public, thereby making a more direct contribution to the solution of the nation's problems and to the ideal of providing equal access to library service for all citizens.

In this project, 11 of 38 replying library personnel said that they shared the equipment with other elements in their agency (21 did not), and five of 38 said they extended service to researchers not sponsored by any of the agencies supporting the participant libraries. While the data gathered did not include that of service provided to the public, we were informed that the Project supported both the White House Conference and the Talinet Project, through which the public could tie into federal library resources. Whether the Project reached this objective cannot be evaluated.

11. By meeting the above objectives, to provide a prototype for a federal library network which could in turn become the nucleus of the national library network.

According to the information by which to judge this objective, only two of the objectives (2, 7) were met by the data gathered during this project. (No data were available for objectives 1-6 and 8.) A prototype for a nucleus of a network cannot be said to exist.